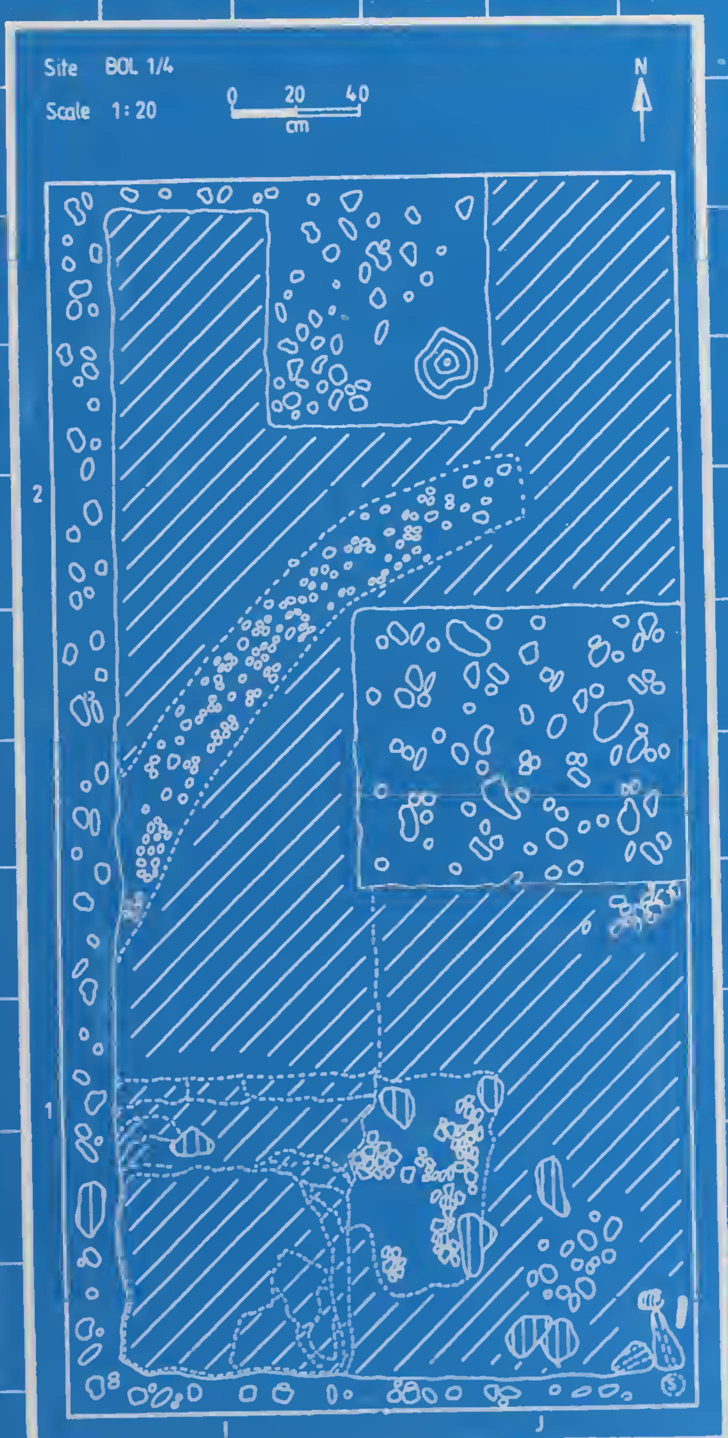
n african Field archaeology

2004/5 Vol. 13 & 14



Albany Museum Somerset Street Grahamstown 6139 South Africa ISSN 1019-5785

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The aim of *Southern African Field Archaeology* is to communicate basic data to professional archaeologists and the public.

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Southern African Field Archaeology is published once a year.

Subscription rates are as follows: R50,00 per annum for individuals and R60,00 for institutions. Outside of southern Africa U.S. $25,00 for individuals and U.S. $30,00 for institutions.

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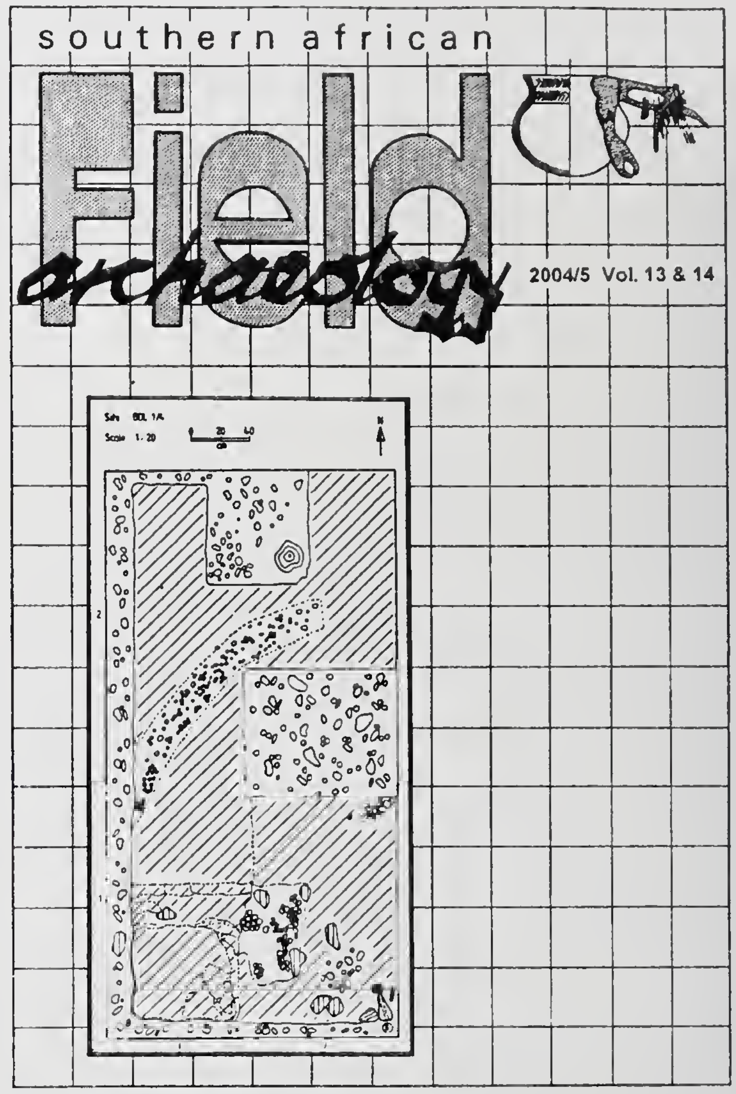
ISSN 1019-5785



Cover illustration:
Excavation plan of a living area at the Late Iron Age site of Thabantšho. See p. 3.

southern african Field archaeology

2004/5 Vol. 13 & 14

CONTENTS

OPINIONS 1

ARTICLES

The Bakopa of Thabantšho: historical background, site description and initial excavations as part of the Maleoskop archaeological project.
W.S. Boshoff, D.J. Krüger & M.M. Leonard 3

Boleu: faunal analysis from a 19th century site in the Groblersdal area, Mpumalanga, South Africa.
Shaw Badenhorst & Ina Plug 13

Later Stone Age burials from the Western Cape Province, South Africa part 1: Voëlvlei.
A.G. Morris, N. Dlamini, J. Joseph, A. Parker, C. Powrie, I. Ribot & D. Stynder 19

A Late Iron Age/contact period burial at Stand 1610, Hillside Street Silver Lakes, Tshwane.
Anton Pelser, Frank Teichert & Maryna Steyn 27

"De-!Kunging" the Later Stone Age of the central interior of South Africa.
A.J.B. Humphreys 36

Archaeological mitigation for Project Lion.
T.N. Huffman 42

Archaeological research along the south-eastern Cape Coast part 1: open-air shell middens.
Johan Binneman 49

RESEARCH NOTES

New evidence for the origin of the Zerrissene Mountain (Namibia) excavations and diggings.
L. Jacobson 78

BOOK REVIEWS

The archaeology of southern Africa. Peter Mitchell.
M.W. Schoeman 81

The figured landscape of rock-art: looking at pictures in place. Christopher Chippindale.
Andrew Salomon 82

Researching Africa's past. New contributions from British archaeologists. P.Mitchell, A. Haouar & J. Hobart
Andrew B. Smith 84

OPINIONS

ISSUES IN CONTEMPORARY ROCK ART PRACTICES.

Rock art studies in South Africa these days probably has the most sophisticated theoretical underpinning in the archaeological corpus. The art can for the most part be explained in a sophisticated manner in terms of the cosmology of the painters. In contrast, our understanding of other aspects such as stone artefacts, whether of style or function, is still somewhat limited. Yet, there are issues that can be improved upon.

In 1998, Johan Binneman recommended in this journal that tracing of rock art should require a permit similar to the requirement for excavating. Since then, however, there appears to have been little discussion on this issue. And it is an issue. Paint as well as the surfaces they are painted on can be fragile and pose problems for the inexpert tracer. In fact, there are stories about

particular paintings that have been marked or damaged by members of the public wanting their own copies and for whom photography is not enough. Repeated tracing could also induce problems. It is therefore difficult to limit tracing when there are no guidelines in place. By making tracing dependent upon a permit, we can establish a set of standards for its control. This should also apply to rock engravings although at first it may seem that they are more durable being carved in stone and lying in the open. Other forms of contact activities are relevant here such as making latex moulds, rubbing, marking with chalk, etc. Furthermore, if local communities, whether farmers or farm workers, are to be trained to act as custodians of rock art sites and tour guides, a base line of good practice needs to be established. It is not only tracing that needs a set of standards. Museum storage, particularly of art mobilier, needs guidelines as well as the handling of such objects. Perhaps members of ASAPA should make a start in discussing these issues. If we want a professional association, we need to be held accountable to professional standards.

One point that needs emphasising, this recommendation is not anti-amateur. There are skilled amateur archaeologists who would make expert tracers just as there are professional archaeologists who have no talent for this activity. Each application should be judged on the merits of the individual and not simply his general archaeological qualification.

Apart from these practical issues, there are other issues facing the rock art community that need careful thought. The establishment of rock art as a tourist drawcard will put selected sites under additional stress. Rock paintings weather and exposing them to large numbers of visitors can result in them fading faster than under natural conditions. The example of Lascaux is particularly pertinent. What does one do? Move to another site or do we consider the conservation of such sites by re-painting them? This is a controversial question and obviously needs much discussion but the sooner a decision is reached the better.

The development of rock art and archaeological tourist centres lead to other issues relating to the tourism experience that are too detailed to deal with here. These include community involvement, the economic sustainability of such centres, the type of educational programs available and their assessment relative to the type of visitor one can expect, the quality and monitoring of tour guides, the authenticity of the programs, etc.

Promoting large scale access to rock art will be a challenging task. It can only be made easier if we have proper ethical guidelines for its curation, conservation and popularization.

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Reference

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Southern African Field Archaeology **13 & 14**:3-12. 2004/2005.

THE BAKOPA OF THABANTŠHO: HISTORICAL BACKGROUND, SITE DESCRIPTION AND INITIAL EXCAVATIONS AS PART OF THE MALEOSKOP ARCHAEOLOGICAL PROJECT

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ABSTRACT

In this article the archaeological sites on the farm Rietkloof 166 JS, in the district of Groblersdal, Mpumalanga are introduced. They form part of the Maleoskop archaeological project, which was initiated during 2001. The idea is to prepare reports as the project develops, in order to publish preliminary data, as it becomes available. The background of the identification of the sites and the project is given, as well as a brief sketch of the historical situation during the 1860s when the BaKopa of Boleu inhabited the site. In this period the first Berlin mission station north of the Vaal River, Gerlachshoop, was established in the vicinity.

During the first season of excavations four test trenches were excavated: one (BOL 1/1) on the summit of Thabantšho, another (BOL 1/3) in a major midden and two more (BOL 1/4 and BOL 1/5) in the living area indicated by burnt hut rubble and stone walls.

INTRODUCTION

The Maleoskop archaeological project represents a research scope that covers a wide variety of archaeological sites concentrated on the farm Rietkloof 166JS, district of Groblersdal, Mpumalanga (Fig. 1). These sites include scattered open air Middle and Late Stone Age locality, a huge Late Iron Age settlement, known to be the site of the BaKopa chief, Kgoši Boleu, and remnants of the Berlin Missionary Society mission station Gerlachshoop. In a certain sense the combination of sites in the broader project area is accidental. They all happened to be situated on the Maleoskop Training Area of the South African Police Service (SAPS) when the project commenced during 2001.

The archaeological project was the direct result of a request by the SAPS that the history of the training area at Maleoskop should be recorded. Ms Anina du Plessis, amateur historian and civilian employee at the Maleoskop Training Area, undertook this task for many years. During November 2000 she and Senior Superintendent Kallie Schuld of the SAPS introduced the archaeological sites of Maleoskop to a group of lecturers in Biblical Archaeology at University of South Africa. Previously, during 1986, she was assured of the historical and archaeological value of these sites by a visiting team of archaeologists, including Prof A. Meyer of the University of Pretoria, Dr U. Küsel of the National Cultural Historical Museum and Ms M. van der Ryst of University of South Africa (Agripol 1986).

The status, ownership and use of the land has changed significantly in the recent past, due to a claim to the land by the BaKopa and the subsequent restitution of land in terms of the Restitution of Land Rights Act (Act 22 of 1994). (*cf* Report No. 80/1995. Portion 3 (A portion of portion 1) of Rietkloof 166 JS, District of Groblersdal, and Province of Mpumalanga: Bakgaga Bakopa Tribe).

The focus of this article is on the identification of, and initial excavations at, Thabantšho a Late Iron Age site, known to be the settlement of Boleu I, situated on the farm Rietkloof 166JS (25.13.20S; 29.32.0E) in the Groblersdal district. The historical archaeological character of research on Thabantšho necessitates a variety of research methods, including a literature review, an archival study of documentary records, archaeological excavations, surveying and mapping and the recording of oral traditions.

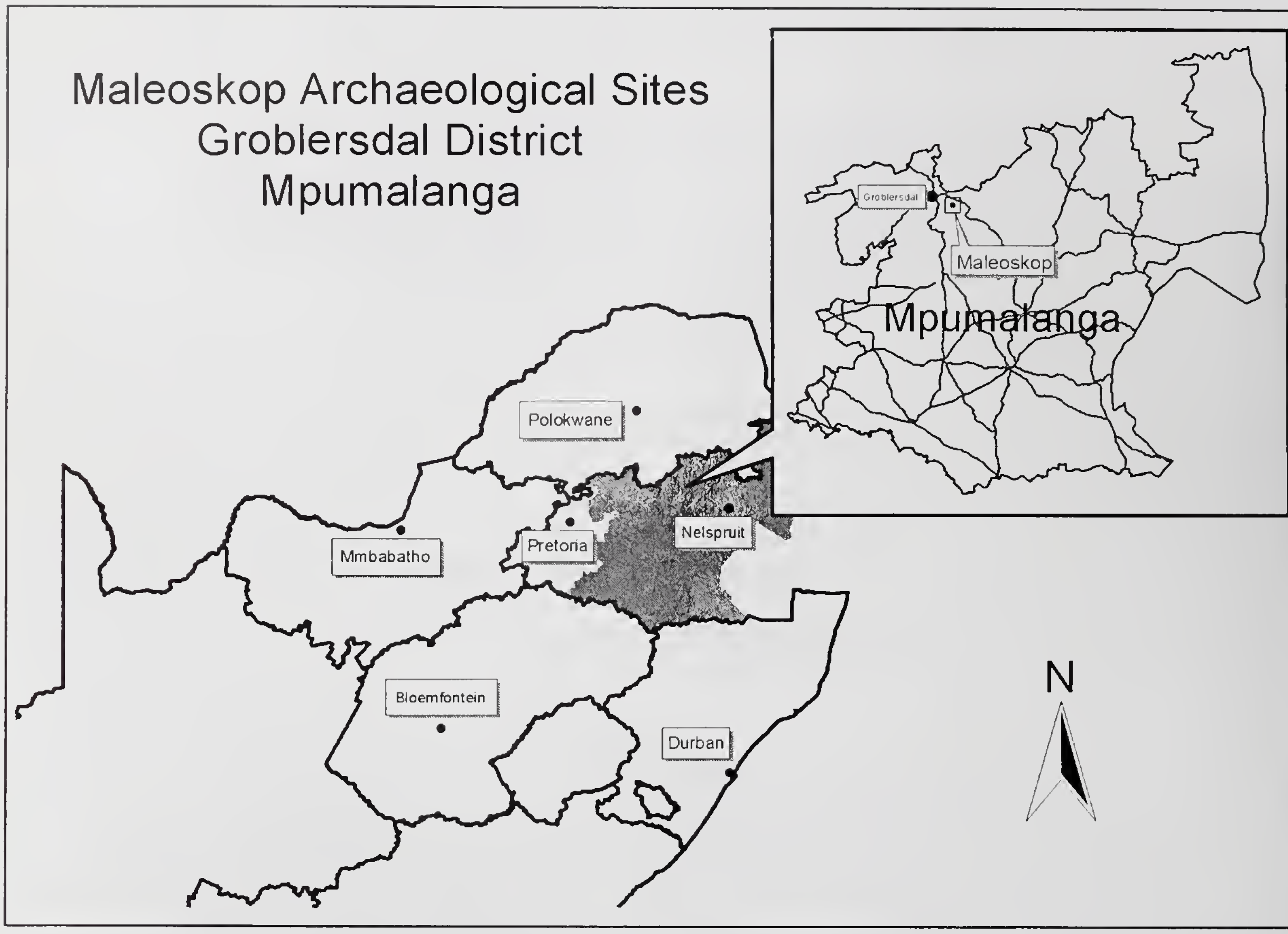


Fig. 1. Maleoskop archaeological sites, Groblersdal District, Mapumalanga.

In this first interim report the focus will be on the identification of the site of Thabantšho on the basis of literary sources, an initial overview of the surface finds, and the results of the excavations of the first four test trenches. In an accompanying article Plug and Badenhorst discuss the faunal remains found during the excavations in 2001 (Plug & Badenhorst 2004, this volume).

The prompt reporting of archaeological excavations is not particularly typical of archaeologists. The non-publication of excavation results is almost proverbial and many sites are better known through 'personal communication' than publication. This is a trend we wish not to pursue thence this first interim report. The problem is not unique to the South African archaeological scene (*cf.* Boshoff 2001:371-391).

THE HISTORICAL CONTEXT

Vivid descriptions of the site where the German missionaries Heinrich Grützner and Alexander Merensky first visited Boleu, the kgoši (chief) of the BaKopa in his village are included in diaries, recollections and articles in the newsletters of the Berlin Missionary Society (*cf.* Berliner Missionsberichte 1862:14-16; Merensky 1888:48-49; Grützner 1900:37; Wangemann 1957:38-40; Zöllner & Heese 1984:118-120, 253-254). The historian Ulrich van der Heyden (2003:334-354) remarked on the value of German Misssion archives for the historiography of South Africa (*cf.* his edition of Merensky's reminiscences, Merensky, 1996).

These sources, especially archival records and contemporary drawings, helped significantly in the process of locating the exact site of Thabantšho (Black Mountain) (Wangemann 1868, illustration facing 402; Transvaal Archives 1860, Inspectie Rapport) (Figs 2 & 3). Initially it was clear that discrepancies existed on the specific location of Maleoskop and the settlement of the BaKopa. In his article, "Die Kôpa-nedersetting van Boleu (Maleo) in Oos-Transvaal", Bergh (1990:5-9) located the settlement in the south-eastern corner of the farm Rietkloof 166JS (see also Bergh (ed) 1999, map 6.4). However, reconnaissance in an area further north identified a hill that fits the evidence perfectly. A drawing by Theodor Wangemann, who visited Gerlachshoop and the site of Boleo's village in 1867, depicts a high central hill flanked by two smaller hills as the site of Thabantšho (or Thaba Leschuchuru/Thaba Nschu, Wangemann 1957:56, 1992:23). The original painting is part of the collection of the National Cultural History Museum (HG 6036; National Cultural History Museum 1992:23).

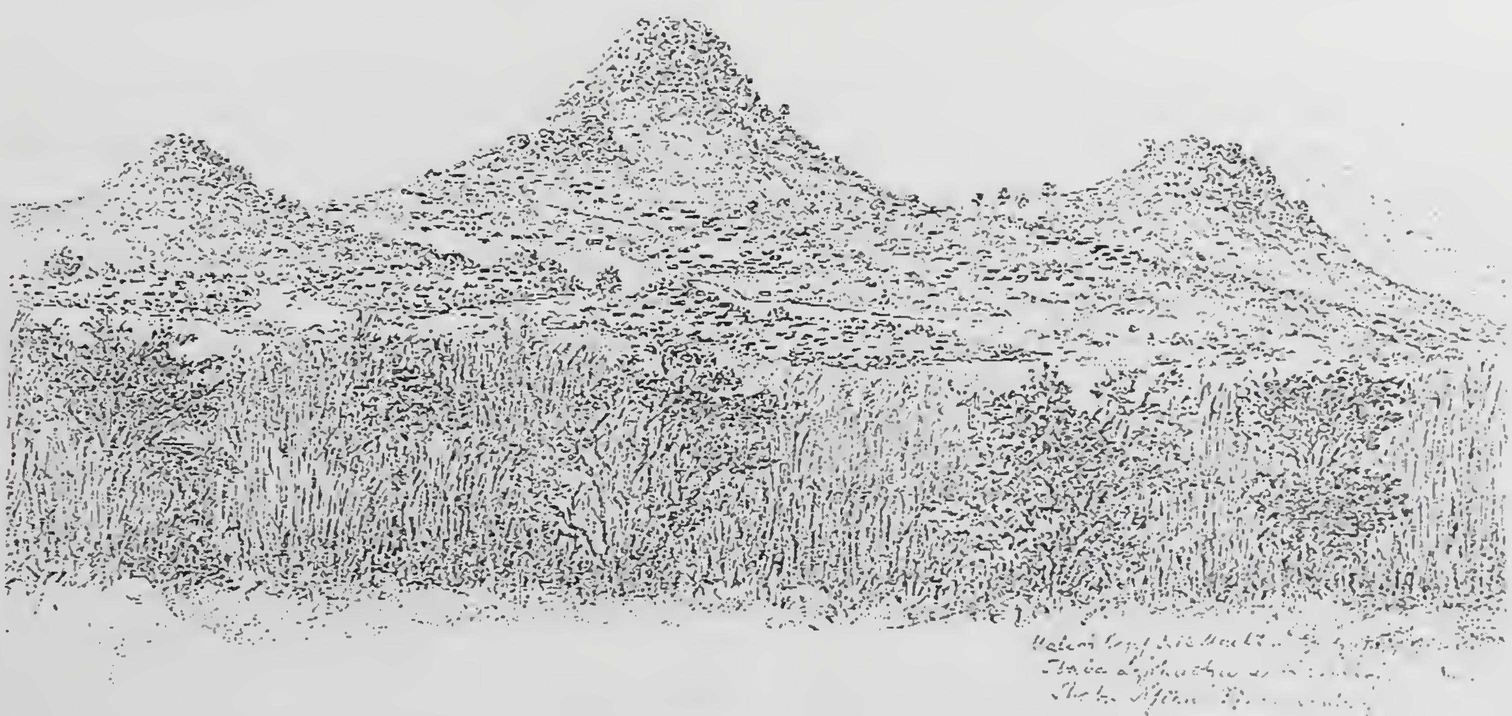


Fig. 2 & 3. Thabantšho from the north (top), and Wangemann's sketch of Thabantšho (bottom).

Evidence of extensive stonewalling, hut remains and pottery pieces, as well as correlating oral evidence, points to this site, rather than the hill purported by Bergh, as the settlement area of the BaKopa. A good reason for Bergh's positioning of the settlement where he did is the fact that modern maps indicate a prominent hill (and by far the highest hill) in the south-eastern corner of the farm Rietkloof 166 JS as "Maleoskop", while an adjacent hill is indicated as "Boleu". The three hills where Boleu's village was situated are indicated by height only.

After being allocated two neighbouring farms, Rietkloof and Weltevreden, by the Lydenburg government in 1859, the BaKopa moved from their previous settlement on Oude Stadt to settle in the vicinity of a hill they named Thabantšho. A complex political situation existed in the area in the latter part of the 18th century. The often disturbing history of the BaKopa and the surrounding groups must be seen in the context of the various, and often

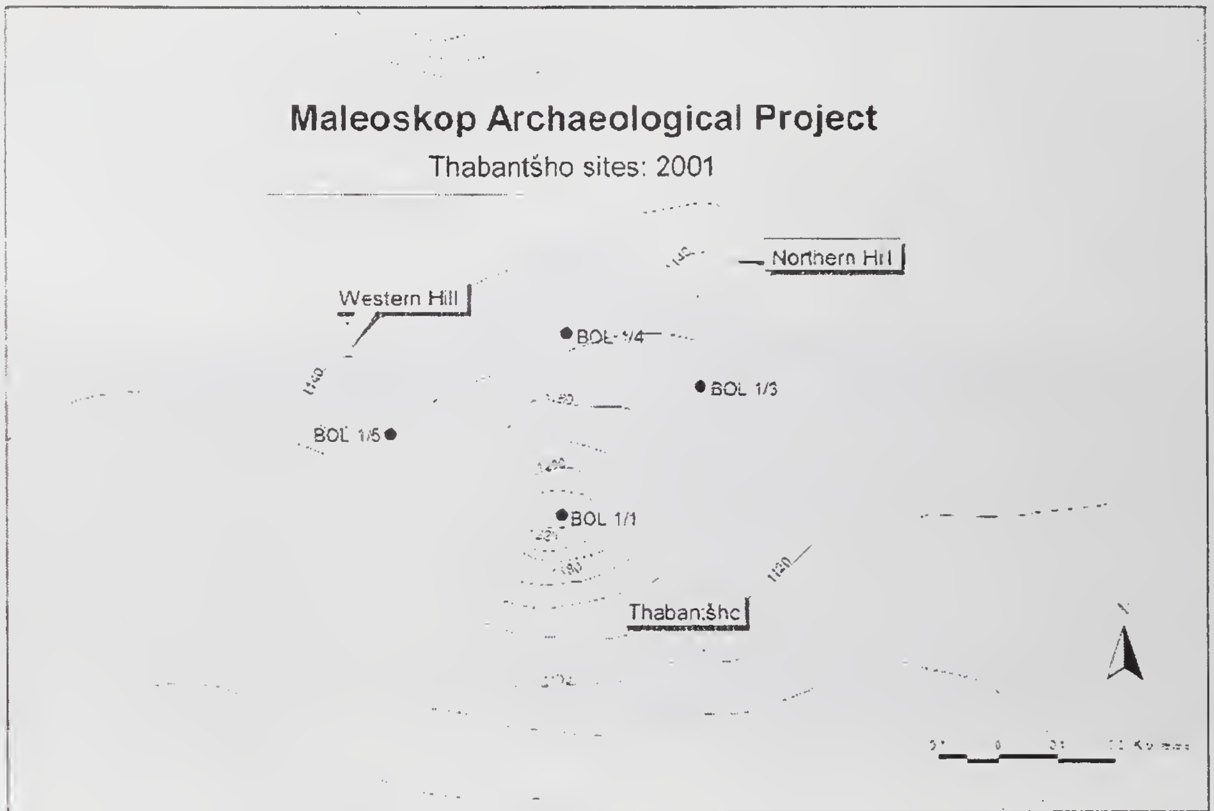


Fig. 4. The location of the test trenches, 2001 season.

very ambitious, political groups such as the Ndzundza-Ndebele under Mabhogo, the Lydenburg government, the government of the ZAR and the BaKopa. They had to compete for limited resources as well as to forge a position for themselves in the area. Factors such as the groups' inability to establish borders led to rising tensions in the area and eventually to armed clashes (Van Rooyen 1951: 142-145; Heydenrych 1991:138). Constant cattle theft, for example, necessitated the use of armed Boer patrols in the area. Mabhogo of the Ndzundza-Ndebele and Boleu (occasionally referred to as Maleo) of the BaKopa decided to resist an armed Boer patrol, which culminated in an unsuccessful reprisal attack on the BaKopa settlement in October 1863 (Du Plessis 1998:2). (The BaKopa rather than the Ndebele were attacked since Mabhogo and his people were fortified in Mapochskraal.)

The conflict intensified and with the assistance of Swazi mercenaries the BaKopa was successfully attacked on 10 May 1864. Boleu himself, approximately 850 of his soldiers and countless women and children were killed in the battle or taken captive. The survivors were either taken away by the Swazi or dispersed to the neighbouring farms and settlements (Grützner 1900:44-48; Wangemann 1877:122). A significant Christian contingent existed in the tribe as a result of the work of the Berlin missionaries stationed in the area. Initially most of the survivors returned to the area and resettled close to Gerlachshoop. Conflict with both Mabhogo and the BaPedi chief, Sekhukhune, lead to the final dispersal of the BaKopa in three small groups. The Christians converged under Rammupudu, the surviving son of the king, and during January 1865 they joined the missionaries at Botshabelo, which had been founded by Alexander Merensky (Kratzenstein 1893: 204-205; Van Rooyen T S 1951:145; Wangemann 1957:65-73). Another contingent chose to follow Matsepe, a half brother of Boleu, who settled at Leeufontein.

A SURFACE STUDY OF THABANTŠHO

The settlement area around the central hill was, for practical reasons, divided into three separate research areas (Fig. 4). The areas will be discussed and dealt with separately. These are:

The central hill or Thabantšho
The northern and western Hills
The living areas surrounding Thabantšho

Thabantšho

It is easy to distinguish Thabantšho with its unique shape from the surrounding hills. The hill has a commanding view of a very large surrounding area and is well suited for a defensive role. It is probably for this reason that the hill and the surrounding area were settled. The German missionary, Theodore Wangemann, describes the hill in the following way:

> The hilltop is overgrown with thick bushes of aloes, sweet thorn and tree Euphorbia, which is naturally impenetrable, but also fortified further by huge stone formations (our translation) (Wangemann 1957:38).

Reconnaissance confirmed the existence of elaborate stone walls on the slope and on the summit of Thabantšho

Fig. 5. Stone walls on the summit of Thabantšho.

(Fig. 5). The stone walls at the top encircle the summit of the hill with a central "courtyard" and "rooms" extending to the western, southern and eastern sections of the hill. A second stone wall encircles the hill lower down. This stone wall forms a continuous line around the hill. A number of smaller stone wall enclosures were found between the base of the hill and the lower stone wall mentioned above. The stone walls around the summit and lower down around the hill seem primarily to have a defensive role. This is also how the missionaries described these walls. It is possible that the stone enclosures could have been used to keep livestock. All the walls on the slopes of Thabantšho were constructed mainly of magnetite stones, which abound in the area.

A test trench, indicated as BOL 1/1, was excavated on the summit to establish the possibility of habitation. The trench consists of two arbitrary layers of 10 cm each and ended in a sterile soil layer. Apart from a small amount of charcoal and scattered non-indicative pottery pieces, no indication of habitation has been found. On completion the trench was refilled for conservation purposes.

Along the northern slope of the hill, above the lower circular wall, remains of structures of which the shape and building material appear to be unusual were found on an overgrown terrace. Four structures were found in this area and a fifth on the summit of the hill. Characteristic of these structures is that the walls were apparently plastered with red clay. One of the buildings is rectangular in form and seems to have been built with sun dried mud bricks. In the three related structures mortar was used to plaster the stone walls. These structures are currently under investigation and the results of the excavations will be published in the near future.

Northern and Western Hills

Extensive stone walls were also found on the northern and the western hills. As in the case with the stone walls on Thabantšho, these walls form a continuous line around the hills. The position of these hills relative to Thabantšho and the way in which the stone walls were constructed, represent a defensive rather than a settlement function. From archival records and reports by the missionaries we know that firearms were used in intertribal conflicts of the era (*e.g.* Wangemann 1957:49). Use of firearms is evident from the presence of a number of loopholes in the stone walls. In addition to the position of the two hills and the evidence of stone-walls, no substantial evidence was found to indicate that the two flanking hills were inhabited. The use of firearms and the extensive defensive structures illustrate the turbulent atmosphere of the second half of the nineteenth century (Berliner Missionsberichte 1864:332-342; 348-353; Grützner 1900:42).

The Living Areas

The living area represents the largest research locale and extends from an area to the east of Thabantšho in an arc to

Fig. 6. The midden excavation, Bol 1-3.

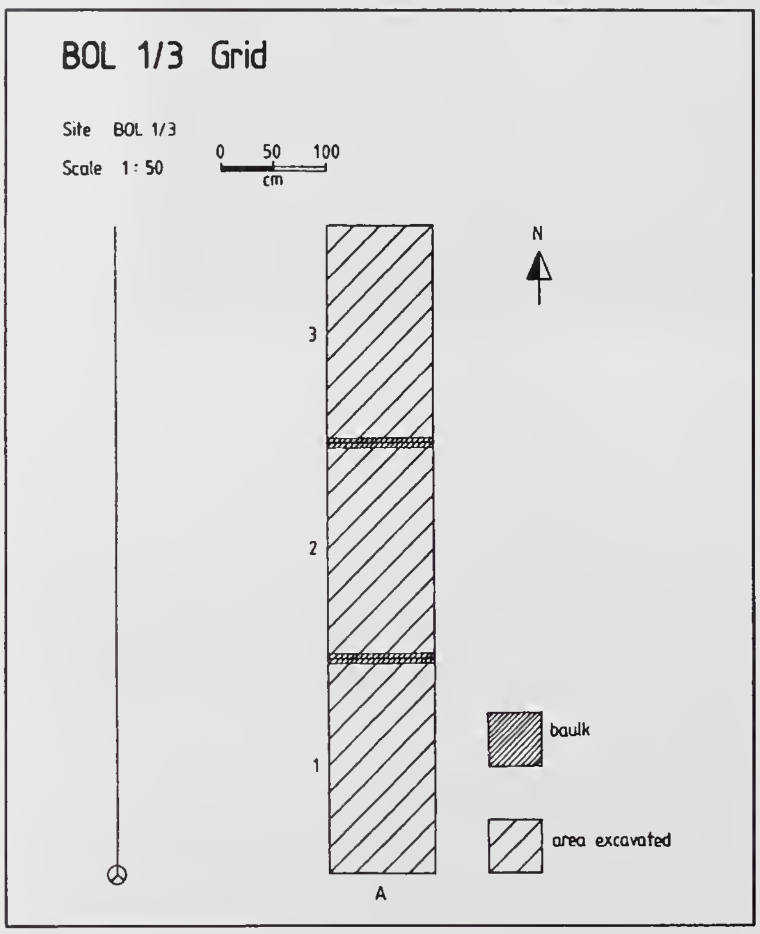


Fig. 7. BOL 1-3 Site plan.

the west. A clearly demarcated area, to the south of Thabantšho, is also found and is clearly separate from the northern living areas. These areas contain widespread hut floors and burnt hut rubble, circular stone structures and extended stone walls, middens, pottery and grinding stones. A large stone wall enclosure on the northwestern slope of Thabantšho, with a single entrance at the east, is the most prominent feature on the site. The walls are well preserved and in some places stand to a height of approximately 1,5 m. our preliminary interpretation of this feature is that it was used as the *kgoro* or royal court.

Three test trenches were excavated in the living areas during the 2001 season (Fig. 6). A trench (BOL 1/3) was dug to expose a large midden in the sloping area between Thabantšho and the Northern hill. The trench constituted three squares of 2m x 1m each in a north–south orientation (Figs 7, 8, 9 & 10). A substantial number of faunal artifacts, potsherds, cultural objects, beads and charcoal were unearthed during the excavation phase. The trench was eventually refilled for conservation purposes.

Burnt hut debris and scattered pottery gave an indication of a living area and thus prompted the location of the excavation at BOL 1/4 (Figs 11, 12, & 13). In three separate trenches (1m x 2m, 1m x 2m and 2m x 4m) clear signs of red hut clay, pole imprints and broken pottery, of which some was found in situ, were uncovered. A hut floor was also identified. The excavation exposed a sterile layer of small stones that might have been used to level the surface for building purposes.

The excavation designated as BOL 1/5 (2m x 2m) is situated in the area between Thabantšho and the western hill (Figs 14 & 15). The presence of the enclosure (*kgoro)* discussed above, and a concentration of grinding stones, hut rubble and pottery guided the choice of location for this test trench. A substantial amount of charcoal was found as well as a number of *in situ* broken pots and upper and lower grinding stones. No decorated pottery was found in this excavation. Characteristic of this trench was the disturbance due to vegetation (especially Euphorbia roots) and exposure to the elements. For this reason only half of the designated area was eventually excavated. The test trench was covered with soil after the excavation had been completed.

CONCLUSION

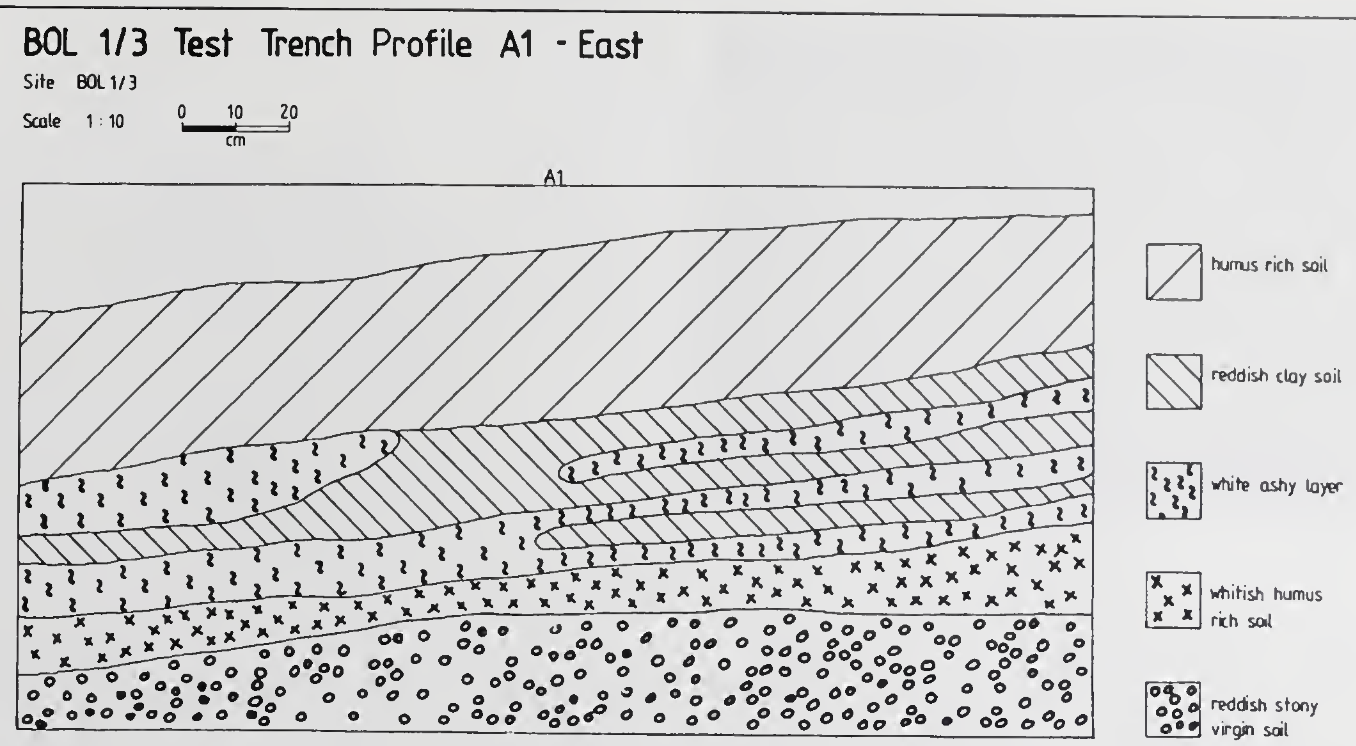
The combination of historical sources and archaeological information enabled us to enrich our interpretation of the material. There is no doubt that the location of the BaKopa village and the mission station, Gerlachshoop, has been positively established. Surface reconnaissance identified extensive stonewalling for defensive and demarcation purposes. In the process information on the spatial arrangement of the site has been gathered. These finds coincide with expectations raised by historical sources.

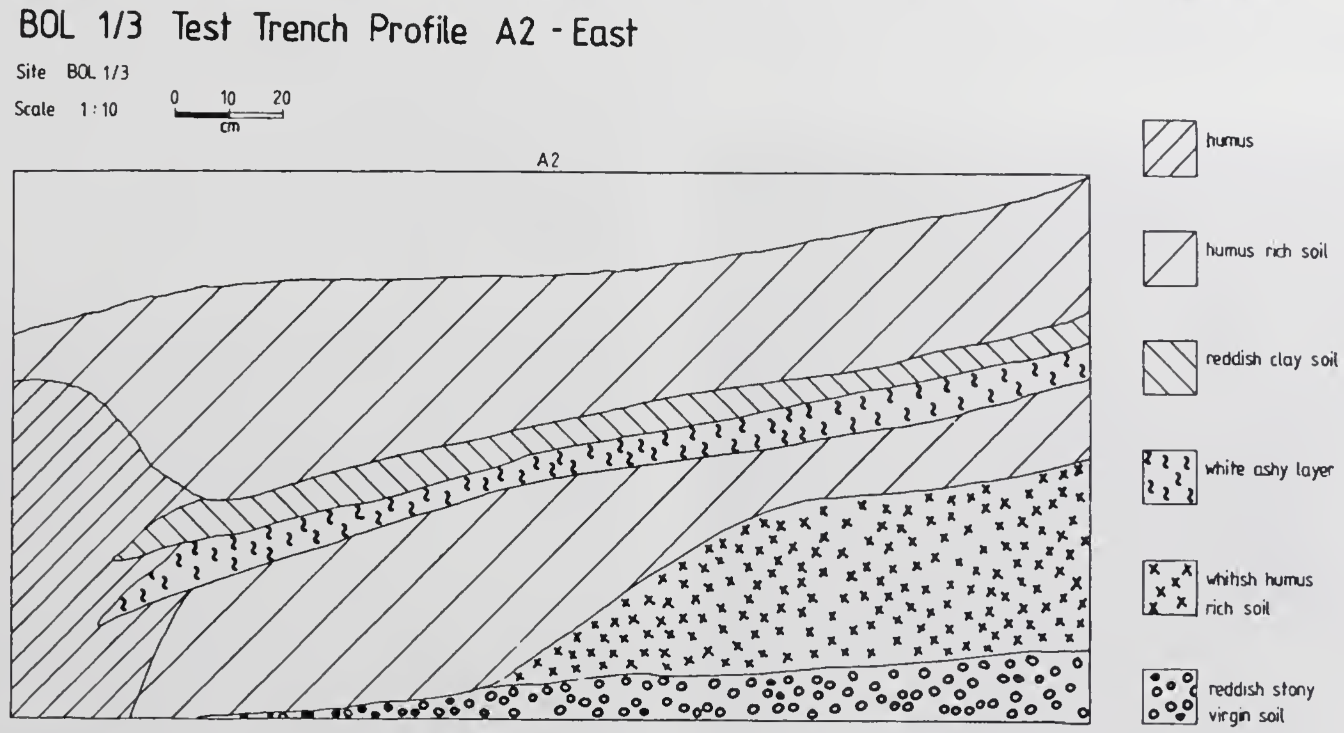
Four test trenches located in specific areas (summit, midden and living areas) yielded useful information in terms of the material culture of the people who inhabited the sites. Types of data found included datable organic material, a good collection of faunal remains, and a relatively small but significant amount of indicative pottery and indications of building methods.

Investigations at Maleoskop will continue in future seasons with the excavation of specific features detected during the surface reconnaissance. These include a possible family unit (kgoro) consisting of various hut floors and a demarcation wall (*cf.* Mönnig: 1967:222). Surface finds in the area include a possible courtyard with pottery, grinding stones and a midden.

ACKNOWLEDGMENTS

We would like to acknowledge the support and participation of various individuals and groups in the project.





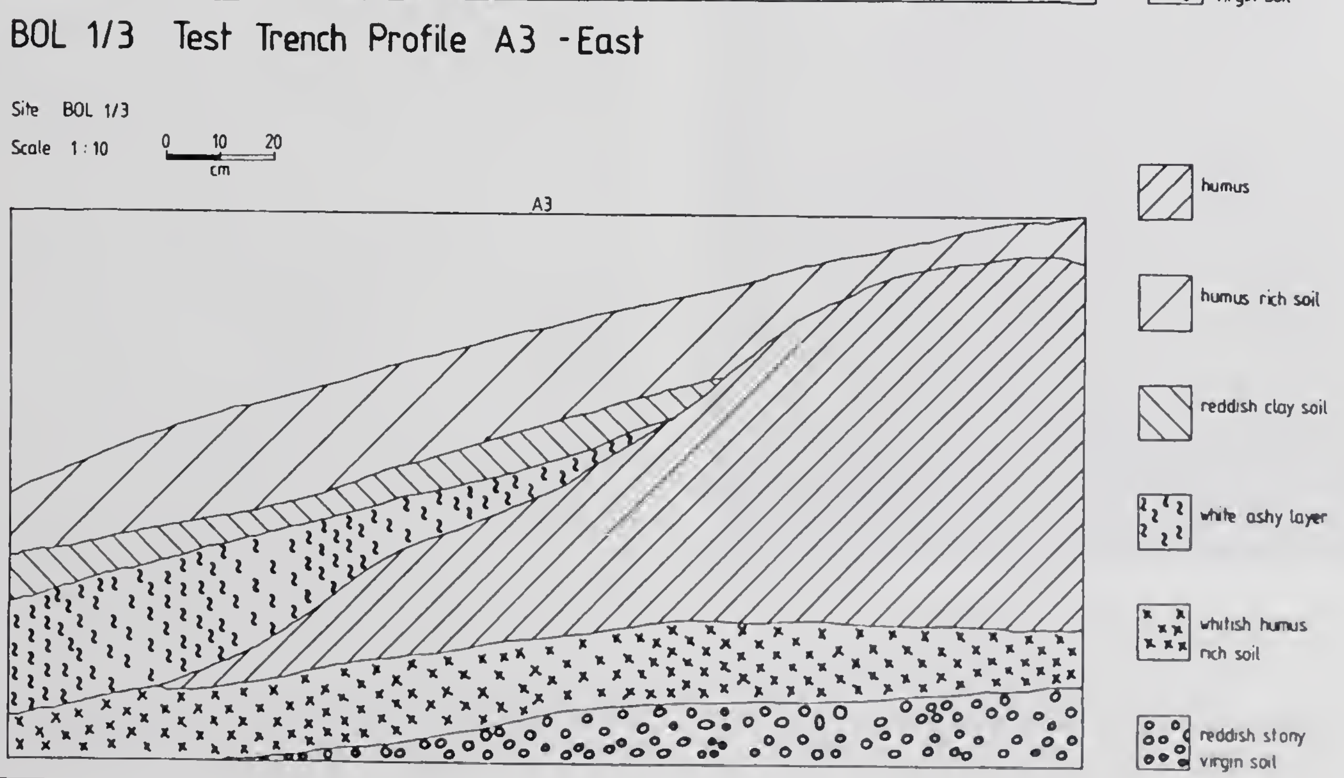


Fig. 8. BOL 1-3 profile A1 new (top), Fig. 9. BOL 1-3 profile 2A east (middle) and Fig. 10. BOL 1-3 profile A3 east (bottom).

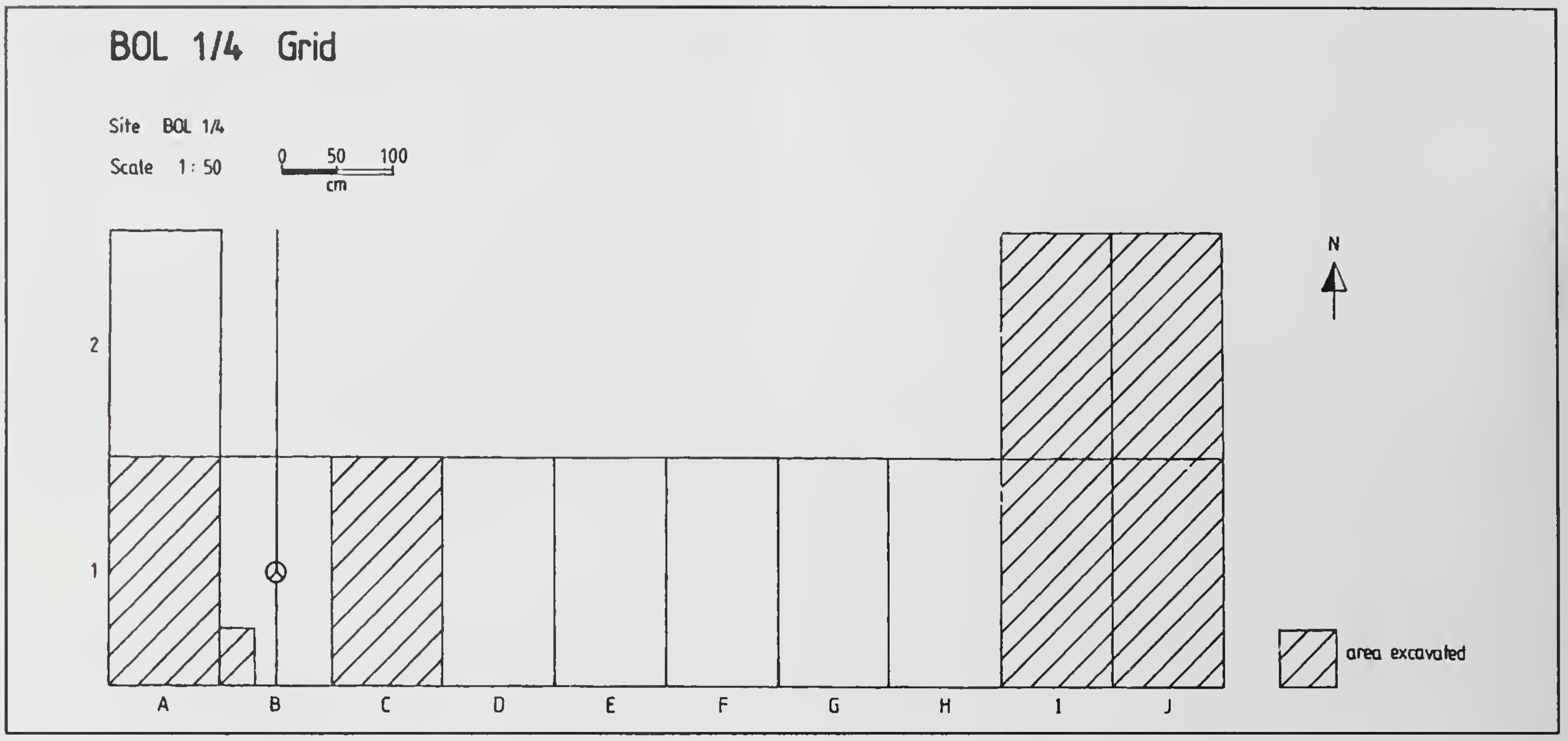


Fig. 11. BOL 1-4. Site plan.

Fig. 12. The living area excavation, BOL 1-4.

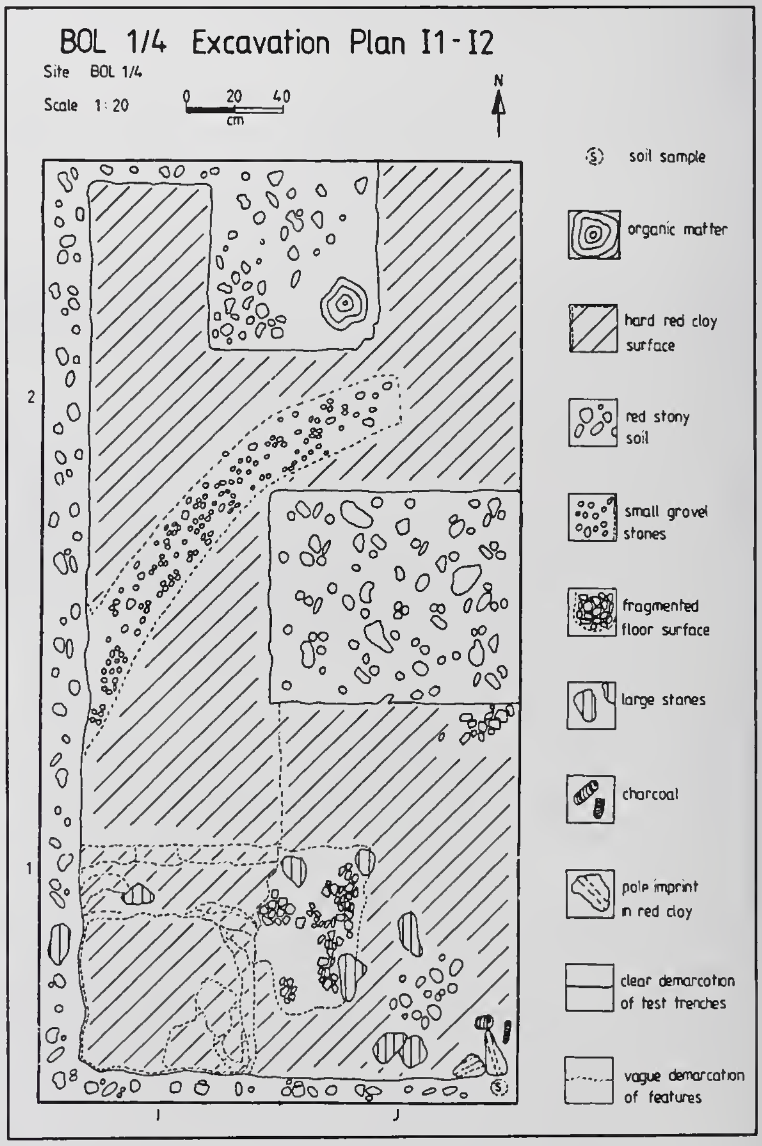


Fig. 13. BOL 1/4. Excavation plan I1-I2.

Mrs Anina du Plessis supplied us with the basic information and introduced us to Maleoskop and the history of Boleu. The Kgoši Boleu II of Tafelkop, OC of the police-training base at Maleoskop, Kallie Schuld, rendered

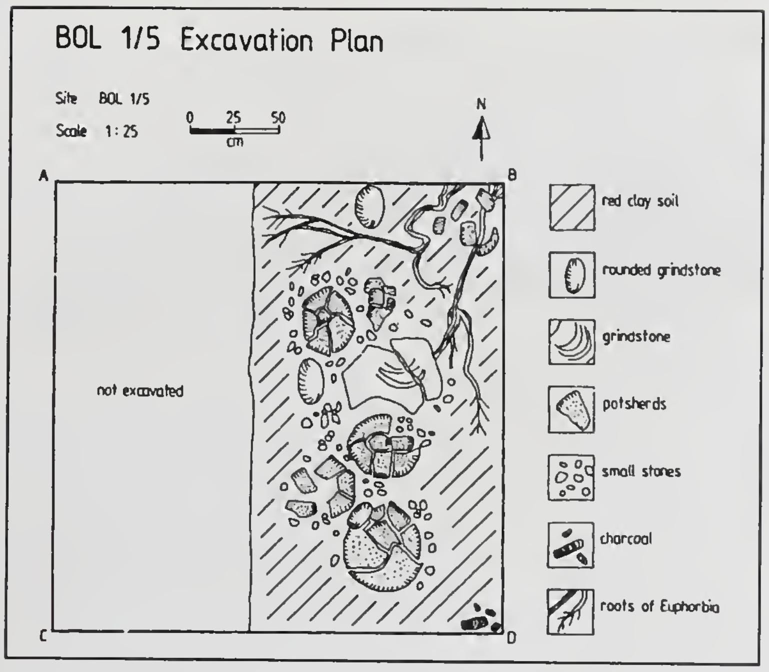


Fig. 14. BOL 1-5. Excavation Plan.

Fig. 15. Pottery in BOL 1-5.

all possible assistance to enable us to do the work. Colleagues and friends, Proff Andrie Meyer (UP), Frik de Beer (Unisa) and Coenie Scheepers (Unisa), Drr Julius Pistorius (UP), Magdel le Roux (Unisa), Chris le Roux (Unisa), Messrs Helgaard Prinsloo, Johan Nel (UP), Francois Erasmus (SAHRA), Johan Enslin and mss Kitty Schneider (Unisa) and Loudine Philip (UP). Erika Cruywagen, for her contribution to the project and the maps she created. The Unisa group of students and volunteers of the Biblical Archaeology group have contributed in different ways to the project. We also want to acknowledge the professional services of Shaw Badenhorst (Transvaal Museum), Joos Esterhuisen and Sanet Eksteen (UP) and Helgaard Prinsloo.

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Southern African Field Archaeology **13 & 14**: 13 -18. 2004/2005.

BOLEU: FAUNAL ANALYSIS FROM A 19th CENTURY SITE IN THE GROBLERSDAL AREA, MPUMALANGA, SOUTH AFRICA.

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ABSTRACT

Faunal remains from chief Boleu's village in the Groblersdal area, Mpumalanga, South Africa were analysed. The site dates to the terminal Late Iron Age. The sample provided information about the economical strategies employed by the inhabitants. Herding appeared to be very important, and cattle remains dominate the faunal sample. German missionaries lived amongst Boleu's people and their reports provided important information about the economy of the people.

INTRODUCTION

Chief Boleu (known to the Boers as Maléo) and about 3000 of his northern Basotho followers of the Bakopa tribe settled on a rocky hill called Lesjoegoeroe taba nkwanië (Wangemann 1868) (or Thaba Ntsu) in the Groblersdal district of the Mpumalanga Province, South Africa in the mid 1800's.

Missionaries from the Berlin Missionary Society worked amongst Boleu's people from a small house close to the mountain village. The two young missionaries, Alexander Merensky and Heinrich Grützner, were in contact with the director of the Society, Theodor Wangemann, whom expected regular reports and diaries from all the missionary stations on the subcontinent (Wangemann 1868). Many of these reports were published, introducing the reader to the various missionary stations, the local people and their customs, the successes and failures of the missionaries, and the experiences of those who accepted the Christian faith (Wangemann 1868).

The Zuid-Afrikaansche Republiek (ZAR) was administrating the Swazi Kingdom and on 10 May 1864, with the ZAR's consent, the Swazi's attacked Boleu's mountain village. The chief as well as most of his people were massacred and the village was abandoned (Wangemann 1868).

The first archaeological excavations of the site by the Biblical Archaeology Task Group of the University of South Africa under Prof W. Boshoff commenced in August 2001. Four different areas were excavated on and around Thaba Ntsu (W. Boshoff, pers. comm.). At the Boleu 1/1 excavation, on the summit of Thaba Ntsu, a 2x1 m square with two arbitrary layers of 10 cm each was exposed. At the Boleu 1/3 midden on the northern slope of Thaba Ntsu three blocks, A1, A2 and A3 were excavated. A 10 cm beam divided the three blocks. Each block is 2x1 m large. The arbitrary layers were 10 cm thick and square A1, A2 and A3 have six, five and five layers respectively. Four squares, A1 (2x1 m), A3 (2x1 m), I1 (2x2 m) and I2 (2x2 m) were excavated at the Boleu 1/4 dwellings on the northern side of Thaba Ntsu. A 1X1 m square in a neck of Thaba Ntsu at Boleu 1/5 was excavated. The single layer from this square was 10 cm thick.

THE FAUNAL SAMPLE

The faunal remains from Boleu's village were identified at the Transvaal Museum in Pretoria. The total sample consisted of 1439 bone and shell artefacts with a mass of 4886,5g, of which 242 specimens or 16,8% of the total sample were identified to species or size level (Table 1). Number of Identified Skeletal (or Specimen) Parts (NISP) and Minimum Number of Individuals (MNI) were used to quantify the faunal remains. Even though all the remains from each square and level were analysed separately, the remains from the excavated squares A1, A2 and A3 were combined for this report. The species list follows the classifications of Meester *et al.* (1986) for mammals and Connolly (1939) for molluscs.

Five fossilized bone and ivory were also submitted for identification, and will be dealt with separately in this report [1].

Table 1: Boleu: total faunal sample.

	Boleu 1/1	Boleu 1/3	Boleu 1/4	Boleu 1/5	Total
UNIDENTIFIED BONE					
Enamel	-	18	-	-	18
Skull	-	33	-	-	33
Vertebrate	-	23	-	-	23
Rib	-	201	-	-	201
Miscellaneous	-	646	13	-	659
Bone flakes	-	245	-	-	245
Polished	-	18	-	-	18
TOTA: UNIDENTIFIED BONE	-	1184	13	-	1197
TOTAL: IDENTIFIED BONE AND SHELL	1	238	-	3	242
TOTAL SAMPLE	**1**	**1422**	**13**	**3**	**1439**
MASS IDENTIFIED SAMPLE (g)	0,9	2246,9	-	0,9	2248,7
MASS UNIDENTIFIED SAMPLE (g)	-	2633,0	4,8	-	2637,8
TOTAL MASS (g)	**0,9**	**4879,9**	**4,8**	**0,9**	**4886,5**

RESULTS

Species present

Most of the faunal remains were retrieved from the Boleu 1/3 excavation. Apart from the three ostrich eggshell fragments, no other faunal remains were retrieved from the Boleu 1/5 Square D layer 1 excavation. The Boleu 1/1 square A1 layer 1 excavation yielded a single bone fragment. A variety of animal species was identified from the submitted faunal sample and includes both wild and domestic macromammals, as well as a rodent, human, ostrich, tortoise, terrestrial gastropods and freshwater mussels (Table 2).

Domesticated animals dominate the sample with 76 fragments (31,4% of NISP). Cattle were the single largest contributor with 63 fragments (26% of NISP). Most of the bone specimens, 148 fragments (61,2% of the NISP) were bovid, and only five (2,1% of NISP) were equids. Molluscs constitute 62 fragments (25,6% of NISP).

A human (*Homo sapiens sapiens*) is represented by a single deciduous premolar fragment. The common duiker (*Sylvicapra grimmia*) mandible did not have a second premolar.

Taphonomy

Taphonomical processes affects bone matrix between the death of the organism and the time of its recovery. During the faunal analysis of the sample, different alterations were recorded on the bone fragments. A total of 706 or 49% of the total sample were burnt, and the colours ranged from light and darker brown, black, and blue, gray to white. Cut and chop marks was visible on 12 bone fragments respectively. Three ostrich eggshell from the only excavated layer at Boleu 1/5 were weathered to a greater extent than the rest of the sample. Carnivore chew marks were noted on 18 bones, whilst three were gnawed by small rodents the size of a mouse or rat. Rootlet etch marks were recorded on 211 bone fragments and occurred throughout the deposits. The bushveld gerbil identified from the Boleu 1/3 excavation was fresher than the rest of the bone sample. Bone tools and modified shell remains were recovered from the Boleu 1/3 excavation and are listed in Table 3. Extra bone growth was noted on a third phalanx of an aged *Bos taurus* from A1 layer 6.

Bovid skeletal part representation and animal ages

The bovid skeletal part representation is listed in Table 4. The age classification for cattle (*Bos taurus*) and sheep/goat (*Ovis/Capra*) teeth proposed by Voigt (1983:47-48, 53) were used. The only sheep/goat tooth was assigned to age class V, whilst those for cattle (*Bos taurus*) are listed in Table 5. The postcranial remains were predominantly of adult animals.

DISCUSSION AND CONCLUSION

Faunal remains from archaeological sites dating from the southern African Late Iron Age are usually dominated by domesticated animals, especially cattle (*e.g.* Badenhorst and Plug, 2001), except where the distribution of tsetse flies prohibited this (*e.g.* Plug, 1988). Cattle were central in most Bantu-speaking communities' ritual and social life, and this practice survived well to the present day (*e.g.* Schapera and Goodwin, 1953; Bruwer, 1956; Tomlinson, 1955). Boleu is no exception to this pattern. The faunal remains from the site indicate a community relying mainly on herding to provide protein as domestic animals, especially cattle, dominates the sample.

According to Wangemann (1868), the Basotho practiced herding, hunting and agriculture. The Basotho had a limited amount of guns in their possession, and pitfalls were also used to hunt. Game was still abundant, and elephants, buffalos, lions, jackals, giraffe, hippos and other animals were hunted. Hunting contributed to the diet, although in a lesser degree than herding. Burchell's zebra, bushpig, duiker and steenbok were all hunted or perhaps trapped.

The leopard tortoise, ostrich eggs and freshwater mussel were collected and supplemented the diet.

Some of the giant African land snail remains were modified, indicating that at least some of these shells are

Table 2: Boleu: species present (NISP/MNI).

Species	Boleu 1/1	Boleu 1/3	Boleu 1/5
Homo sapiens sapiens human		1/1	
Equus burchelli Burchell's zebra		5/1	
Potamochoerus porcus bush pig		1/1	
Bos taurus cattle		63/4	
Ovis aries sheep		3/1	
Ovis/Capra sheep/goat		10/-	
Sylvicapra grimmia common duiker		14/1	
Raphicerus campestris steenbok		15/2	
Bovidae I		12/-	
Bovidae II	1/1	19/3	
Bovidae III		11/-	
Tatera leucogaster bushveld gerbil		16/1	
Struthio camelus ostrich		2/1	3/1
Geochelone pardalis leopard tortoise		4/1	
Achatina cf *zebra* giant African land snail		4/2	
Achatina sp. giant African land snail		19/2	
Euonyma sp. terrestrial gastropod		10/10	
Xerocerastus/Edouardia sp. terrestrial gastropod		2/2	
Biomphalaria/Segmentina sp. terrestrial gastropod		4/4	
Small terrestrial gastropod		1/-	
Freshwater gastropod		4/1	
Unio caffer freshwater mussel		18/1	
Total	**1/1**	**238/40**	**3/1**

contemporary with the inhabitation of the site. These snails aestivate during the dry periods and their presence in an archaeological deposit can be ambiguous (Plug, 1990).

The human remains, bushveld gerbil and the small terrestrial molluscs did not contribute to the protein diet of the inhabitants. The single human deciduous premolar could possibly be of a disturbed grave, but this seems unlikely, since the isolated fragment is from a midden. It would rather seem as if this tooth fragment was simply discarded. Gerbils burrow in soft deposits and were self-introduced. The small terrestrial molluscs are too small to be a source of protein and were also self-introduced.

All the mammal and reptile species identified from the sample occurred in the vicinity of the site either in historical times or the present day (Du Plessis, 1969; Smithers, 1983; Branch, 1988). The species identified from this sample have been identified from archaeological sites in the vicinity of Boleu's village within the last 500 years (Plug and Badenhorst, 2001).

The colour of the burnt bone fragments indicates the temperature of the heat source. Grey and white calcined bone was exposed to temperatures above 420°C (Gilchrist and Mytum, 1986). This suggests direct exposure to fire or very hot coals, rather than to warm ash disposed of on a midden.

The cut and chop marks noted on some of the specimens are a result of skinning and butchering practices.

The unmodified weathered ostrich eggshell were exposed to the elements longer than the rest of the specimens.

The carnivore chew marks are consistent with those made by dogs. Virtually all Iron Age people kept dogs (e.g. Gallant, 2002) and chew marks by dogs are therefore not unusual.

The single cattle distal phalanx that has extra bone growth is from aged individual and could be the result of old age, disease or trauma, or a combination thereof.

All the bone tools identified from the sample can be regarded as non-formal bone tools. According to Voigt (1983:109), "These [are] not bone tools in the sense that they had been shaped for a specific purpose, but rather pieces of bone (often bone flakes or ribs) which had been picked up and used for a short time for a specific job before being discarded. The most common type of utilisation was polishing and in these cases sharp or natural edges had been smoothed by abrasion. Occasionally, abrasion would form a very rough point but more usually it merely smoothed the edge of the piece into a convex line."

In modern times, bone knives made of cattle ribs similar to those identified from the sample, are used in the production of marula beer. the bone knives are used to prick the marula fruit in order to remove the fleshy pit and to extract the juice (Moifatswane, 1990). It is also possible that some of the bone tools from the sample have probably

Table 3: Boleu: modified bone and shell fragments.

Location	Length (mm)	Skeletal Part	Notes
Boleu 1/3, Square A1			
Layer 3	112	Bovid II tibia shaft	Both ends of the shaft snapped and polished
Layer 4	48	Freshwater mussel shell	Rim and outer shell surface smoothed
	97	Bovid III lumbar vertebrate	Polished at end of transverse process where it attaches to the body
	49	Rib fragment	Polished at one end
	45	Rib fragment	One end polished convex
	103	Rib fragment	Polished at one en and partly one side
	45	Rib fragment	Polished at one end
Layer 5	62	Rib fragment	One end polished into a point like shape
	45	Rib fragment	Polished at one end
	38	Bone flake	Polished at one end
Layer 6	42	Land snail shell	Outer lip of shell smoothed
Boleu 1/3, Square A2			
Layer 2	34	Freshwater mussel shell	Shell rim and outer surface smooth
	30	Freshwater mussel shell	Shell rim and outer surface smooth
Layer 3	67	Rib fragment	Polished at one end
Layer 4	30	Freshwater mussel shell	Shell rim and outer surface smooth
	12	Freshwater mussel shell	Shell rim and outer surface smooth
	18	Freshwater mussel shell	Shell rim and outer surface smooth
	52	Bovid II radius	Shaft polished into point like shape
	62	Rib fragment	Polished at one end
	16	Scapula blade	Polished at one end
Layer 5	47	Rib fragment	Polished at one end
	28	Rib fragment	Polished at one end into a convex line
	161	Rib fragment	Polished at one end into a convex line
Boleu 1/3, Square A3			
Layer 2	170	Rib fragment	One end polished into a convex line
	151	Rib fragment	Polished at one end into a point like shape
	58	Rib fragment	Polished at one end
	44	Land snail shell	Outer lip of shell smoothed
	52	Cattle mandible ascending ramus	Part of ascending ramus below condyle/neck polished into flat line
Layer 3	176	Rib fragment	Both ends polished convex
	16	Freshwater mussel shell	Shell rim and outer surface smoothed with small hole drilled through near rim

been used in the hide working process.

The tibia shaft of a Bovid I size animal of which both ends were snapped and polished, is similar to bone flutes still in use today.

Some of the giant African land snail shell fragments were utilsed as either scoops or in the pottery manufacturing process, in addition to their possible exploitation as food source (Voigt 1983:120). The freshwater mussels, also possibly used as food source, were sometimes used to burnish pots (Voigt 1983:120). This type of utilasation was noted, for example, from a military outpost dating from the Anglo-Boer War in the Kruger National Park, South Africa (Badenhorst *et al.* 2002). From Boleu the freshwater mussel fragment with smoothed edges and a hole drilled through near the rim was probably strung on a leather thong and worn as decoration.

The bovid skeletal part representation does not suggest any unusual trends. Teeth have a high survival rate and the adult bovid have 32 permanent teeth. It is therefore to be expected that teeth should dominate the bovid skeletal list.

Although very few cattle teeth were identified, the majority of the postcranial material is from adult animals.

The environment seems to have been optimal for domestic stock herding. Tsetse has not been present in this part of South Africa during historical times (Fuller 1923), and the dominance of cattle remains supports this.

ACKNOWLEDGEMENTS

We would like to thank Prof Willem Boshoff for making the material available for study, Miss Stephany Potze from the Transvaal Museum who identified the rodent material

Table 4: Boleu: bovid skeletal part representation.

Skeletal Part	Bovid I	Bovid II	Bovid III	Total	Total %
Horn core			4	4	2,7
Skull & mandibles	7	5	14	26	17,5
Teeth	23	4	8	35	23,5
Scapula	2	2	2	6	4,1
Humerus	1	1	2	4	2,7
Radius	1	4		5	3,4
Ulna		4	1	5	3,4
Pelvis			6	6	4,1
Femur	3		7	10	6,8
Tibia	2	5	4	11	7,4
Metacarpus			4	4	2,7
Metatarsus	1	3	2	6	4,1
Metapodial			3	3	2,0
Os carpi			3	3	2,0
Os tarsi	1		1	2	1,4
Sesamoid, Patella		1	2	3	2,0
Proximal Phalanges		1	5	6	4,1
Medial Phalanges		3	3	6	4,1
Distal phalanges		1	2	3	2,0
Total	**41**	**34**	**73**	**148**	
Percentage (%)	27,7	23,0	49,3		100

Table 5: Boleu: cattle age class representation per NISP/MNI.

Age Class	NISP
III	3/1
VII	1/1
VIII	3/1

and Miss Tersia Perregil from the Transvaal Museum library for providing some of the literature.

Foot note

1. Five fossilized bones, exposed by farmer Jan Hessels on his cultivated land on the farm Diepkloof in the Groblersdal district, were also submitted for identification. These were a complete left astragalus of the extinct horse, *Equus capensis*, that had a wide distribution across southern Africa before it became extinct between 10 000 and 8000 BP (Plug and Badenhorst, 2001). Three ivory incisor fragments were from a hippo (*Hippopotamus amphibius*). A large post cranial bone fragment could not be identified.

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Southern African Field Archaeology **13 & 14**: 19 - 26. 2004/2005.

LATER STONE AGE BURIALS FROM THE WESTERN CAPE PROVINCE, SOUTH AFRICA PART 1 : VOËLVLEI

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ABSTRACT

Two human burials eroding from the edge of a sandbank at Voëlvlei in the Mossel Bay district were excavated in a rescue dig in 1996. The analysis and dating of the skeletons indicate that they are likely to have been the skeletons of Khoekhoe pastoralist people from the period just before the arrival of Europeans at the Cape. Voëlvlei 1 is the skeleton of a tall woman who probably died in her 30's. Her dental health was reasonable but she was beginning to feel the impact of a degenerative joint disease in her right hand and elbow, and especially in her lumbar vertebrae. Sometime during her life she had broken her nasal bones. Voëlvlei 2 was an elderly man who died somewhere in his 50's or even his 60's. He was shorter than the Voëlvlei 1 woman, but still relatively tall for a KhoiSan individual. He had advanced degenerative disease throughout his skeleton and must have had reduced mobility and pain from his neck and probably several other joints.

INTRODUCTION

Human remains were found eroding out of a sandbank on the edge of the Voëlvlei lagoon in April 1996.The discovery was reported to the South African Police and to Ms L. Labuschagne, the director of the Bartolomeu Dias Museum in Mossel Bay. Two discrete burials were exposed by erosion and although bones from one (Voëlvlei 1) were removed by the police, the second burial (Voëlvlei 2) was excavated under more controlled circumstances by Mr H. Gerstner, manager of the Cango Caves in Oudtshoorn, at the request of Ms Labuschagne. These two skeletons were submitted to A.G. Morris of the Department of Human Biology at the University of Cape Town in 1999.The specimens were analysed by students in the Department between 1999 and 2001, whose reports form the information base for this final published report.

Voëlvlei (21.50E; 34.16S) is a small lake feeding into the Gourits River, about 10 km from its mouth and about 25 km west of the town of Mossel Bay (Fig. 1). The graves were exposed on the edge of a cattle pathway leading down to the west side of the Vlei. The Vlei itself is trapped between archaic dune systems that have built up a bank around it. The bank is up to 6 metres high in places (Gerstner 1996). Both graves had been dug into grey

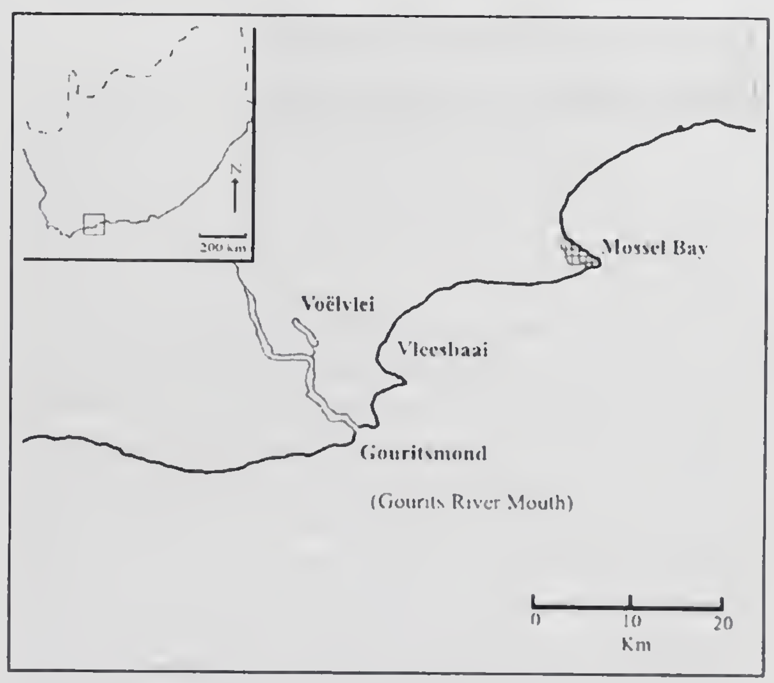

Fig. 1. Map showing location of Voëlvlei site.

organic-rich sands in an area of high erosional impact (Gerstner 1996).

No records were kept of the removal of Voëlvlei 1, but Gerstner's report does provide some information about the Voëlvlei 2 burial. Gerstner took some general pictures of the site but did not formally record the skeleton exposure during excavation. The burial was in a sitting (flexed) upright position with the cranium and knees near the top of the grave shaft. Bones of the hands and feet were co-mingled. The grave shaft was capped by a flat stone 43 x 54 cm in dimension, and the shaft itself was only about 60 cm in width. The deepest point of the grave shaft was 63cm below the level where human bones were first noted in the excavation. It is unclear from Gerstner's report as to the original level of the soil surface and whether or not the capping stone had been buried, but the original depth of the grave was likely to have been at least 80 cm and perhaps as much as 1 metre. No grave goods were recovered, but Gerstner noted the presence of small charcoal fragments in the grave shaft and one small "pot fragment" in the top (disturbed) layer (Gerstner 1996).

The Quaternary Dating Research Unit (QUADRU) based at the CSIR, Pretoria, has dated both Voëlvlei burials. C. Fourie of the museum in Mossel Bay submitted bone samples from Voëlvlei 1, and D. Stynder submitted samples from Voëlvlei 2. The bone collagen dating results were as follows:

Voëlvlei 1: Pta-7178 740 +/- 40 BP ä^{13}C -11.4‰ (calibrated at 95.4% probability to between 1210AD and 1390AD).

Voëlvlei 2: Pta-8760 560 +/- 45 BP ä^{13}C -12.8‰ (calibrated at 95.4% probability to between 1300AD and 1440AD).

DESCRIPTION OF VOËLVLEI 1 (UCT 582)

Despite its exposure through erosion, this specimen demonstrates extremely good preservation (Fig. 2). A few teeth have been lost post-mortem, but the skeleton is essentially complete.

The sex is unambiguously female, based on cranial and pelvic features. The delicate nature of the nuchal crest, tympanic plate and the limited gonial eversion are female features, and the wide sciatic notch, wide sub-pubic angle and projection of the pubic surface along with the evidence scars of parturition all indicate a female identity (Ferembach *et al.* 1980). The age at death is most likely to have been between 30 and 40 years based on the state of development of rib ends, pubic symphysis and iliac auricular surface (Krogman & Ýþcan 1986, Buikstra & Ubelaker 1994). The stature as calculated from the physiological length of the femur is 165.1 ± 2.8 cm based on the SA Negro female formula (Lundy & Feldesman 1987), but much taller at 17.8 cm from the standard ratio of 3.745 x maximum femur length (Lundy & Feldesman

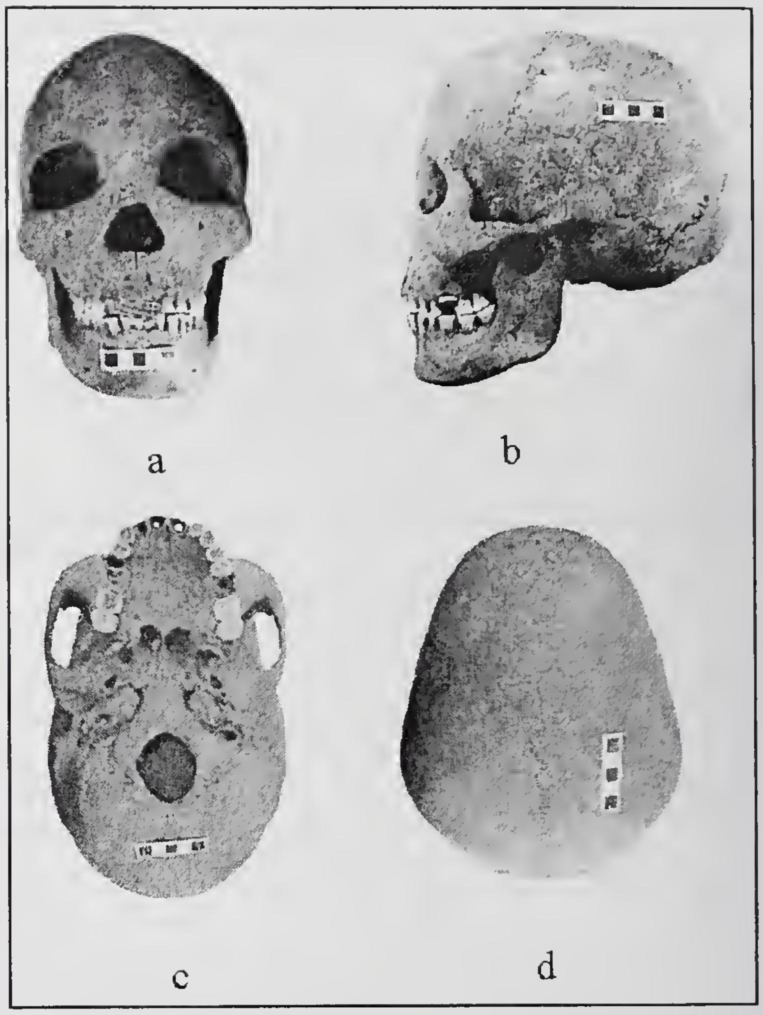

Fig. 2. Cranium of Voëlvlei 1: a) anterior view, b) lateral view, c) inferior view, d) superior view.

1989). No specific standards for age or stature are currently available for KhoiSan populations.

The left and right maxillary M2's have small inter-proximal cavities on their mesial aspects, and both maxillary M1's had been lost before death. The mandible displays a substantial amount of calculus on both the lingual and buccal aspects of the post-canine dentition. This has been matched with significant alveolar resorption.This is the most probable cause of the maxillary tooth loss (Hillson 1996). The caries count is 2 for 25 teeth, and the antemortem tooth loss is 2 for 32 sockets. The tooth wear is heavy for an individual of this age (Morris 1992). Maximum wear is on the anterior dentition and the lower incisors are worn down to pegs. The wear on these teeth is distinctive as it is rounded (Fig. 3).

There are some signs of degenerative joint disease in several places on the skeleton. The right ulna has some slight lipping on its humeral articulation, and the right thumb joint at the distal end of the 1st metacarpal also demonstrates some minor lipping. The fifth lumbar vertebra, on the other hand, does show some advanced osteophyte development that is also present at a lower intensity on the bodies of the other lumbar vertebrae. Schmorl's nodes are present on the inferior surface of the L3 body. The temporomandibular joints are also affected by degenerative arthritis. An interesting anomaly is present in the sacrum. The arch of the first sacral segment has not

Fig. 3. Voëlvlei 1 – occlusal wear on mandible.

fully united with the rest of the sacrum, and its medial spine is divided in the mild version of spina bifida occulta.

Tibial squatting facets are present on the distal ends of both bones.

At some time in the past, this woman had broken her nose. This is visible as a depressed fracture on the inferior half of the nasal bones and the edge of the right frontal process of the maxilla (Fig. 4). The contour is not dramatically changed although the bones are slightly depressed. The damage is well healed suggesting that the trauma had occurred a long while before death.

DESCRIPTION OF VOËLVLEI 2 (UCT 583)

The skeleton is almost complete, but many of the bones are fragmented and few of the long bones are whole (Fig. 5). The skeleton is unambiguously male, as confirmed both by cranial features including a marked supraorbital region, large mastoid and moderate tympanic plate, and robust pelvic features. The age of death is well over 40 years as confirmed by the pubic symphysis morphology (Buikstra & Ubelaker 1994). The auricular surface and the rib ends both suggest an individual in his 50's or even 60's at death (Buikstra & Ubelaker 1994). The stature based on the SA Negro male formula is 159.5 ± 3.8 cm calculated on a humeral length of 30.8 cm (Lundy & Feldesman 1987). No other long bones are complete enough to attempt a height reconstruction.

No dental caries were seen in Voëlvlei 2, but there was some noticeable alveolar disease. Both the right maxillary and right mandibular M3 sockets are abscessed and the lower M3 roots were no longer being supported by the alveolar socket structure (Fig. 6). The mandibular left M1 socket was also diseased. Calculus is present on the buccal surfaces of all the posterior teeth. The wear on the teeth is marked in an oblique occlusal plane one the molars. This is often referred to as helicoidal wear (Tobias 1980). The anterior dentition is even more extreme and the lower incisors and canines are rounded.

The post-cranial bones and the temporomandibular joint all demonstrate severe signs of degenerative joint disease. Not only are the joints affected, but excess ossification is present in several areas of the skeleton. Many muscular entheses are overgrown and the thyroid cartilage is ossified. The vertebral column is especially affected by disease. Osteophytes are present throughout the column on both the facet and body joints. The left facet joint of the C4/C5 articulation is entirely destroyed (Fig. 7), and the T6/T7 bodies have fused. A sixth lumbar vertebra is present, but this has fused with the sacrum to produce a sacrum with six segments.

The left 4th and 5th metacarpals are bent toward the palm at their distal ends and the left 5th metacarpal is shortened (Fig. 8). Radiographic views of the bones (Fig. 9) indicate no visible sign of healing, but the internal structure of the bone is remodeled with a thickened trabecular re-enforcement of the palmar aspect. Metacarpal 4 has a restricted medullary cavity and the cortical bone of the shaft is strongly thickened. It is not clear whether or not the changes were the result of a disease process or an injury, but the metacarpals are common sites for bone fractures. Fracture of the neck of the 1st or 2nd metacarpals is often referred to as a 'boxer's fracture' and inexperienced pugilists may occasionally break the 5th metacarpal because it is more mobile and less supported even when the fist is clenched (Moore & Dalley 1999). Given the advanced age of this individual, if the cause was an injury in youth, there would have been substantial time to allow for the remodeling of the bone structure and the removal of evidence of past fractures.

Tibial squatting facets are present on the distal ends of both bones. There is also mild but healed cribra orbitalia in both orbits. The definition of healed versus active lesions is from Peckmann (2002).

MORPHOLOGICAL IDENTITY OF THE VOËLVLEI SPECIMENS

The general appearance of both crania is strongly suggestive of a KhoiSan genetic identity.

A number of osteological features are present that are common in KhoiSan populations but rare in others. A tympanic dehiscence (foramen of Huschke) is present bilaterally and Voëlvlei 2 also has a distinct mons temporosphenoidalis (De Villiers 1968; Morris 1992). The strongest visual similarity of these specimens to the KhoiSan range of variation is in the face, where the quadrilateral orbits and flat nasal bones are distinctive.

Multivariate confirmation of biological affinity is preferable to non-statistical visual substantiation, so the Voëlvlei specimens were compared to a modern South African sample of Nguni (n = 72) and KhoiSan (n = 58). The Nguni sample is made up of isiZulu, isiXhosa and siSwati linguistic groups (Shrubsall 1898), and the KhoiSan sample is a range of individuals including the large sample of pre-historic individuals from the Riet River (Morris 1992). All metric traits were corrected for size and transformed into Z-scores according to the procedure of Howells (1989). Variable related to the face were selected

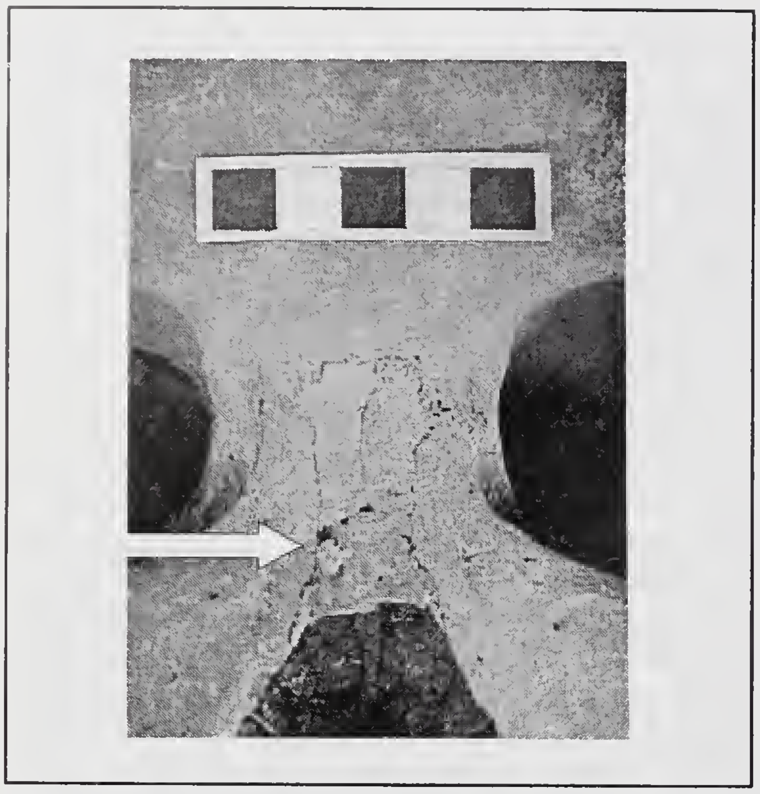

Fig. 4. Voëlvlei 1 – healed fracture of nasal bones.

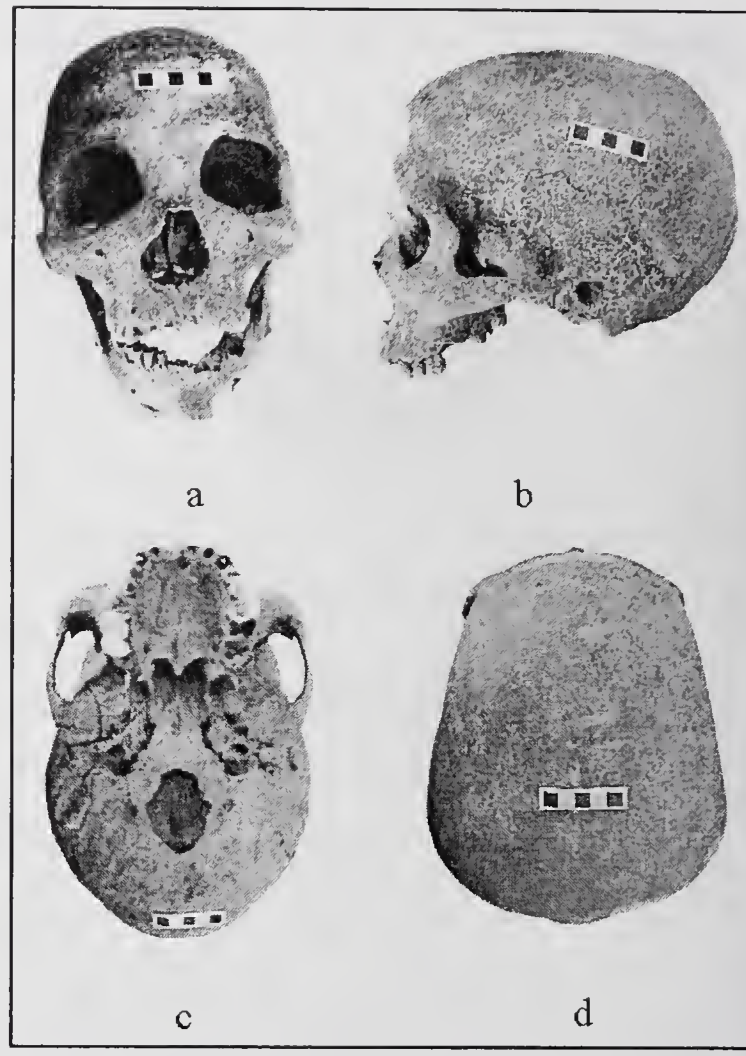

Fig. 5. Cranium of Voëlvlei 2: a) facial view, b) lateral view, c) inferior view, d) superior view.

through analyses of variance. The selected variables were: basion-prosthion length (BPL), greatest biorbital breadth (EKB), bistephanic breadth (STB), minimum frontal breadth (WFB), orbital breadth (OBB), and orbital height (OBH) (Martin & Saller 1959, Howells 1989). The six metric traits were used for factor analysis (Principal Component Analysis with varimax rotation).The output of the analysis is displayed as a scatterplot of regression factor scores with an ellipse of confidence ($p = 0.7$) for each modern sample (Fig. 10).

Although at least 30% of the variation of the comparative groups is overlapping, there is a marked differentiation between Coast Nguni and KhoiSan, especially along Factor 1. The latter reflects a morphological trend related to breadth of face, breadth of orbits and facial projection. The trend has two extremes: a KhoiSan one of low values, and a Coastal Nguni one with high values. The Voëlvlei specimens are positioned in the middle of the KhoiSan range of variation and slightly outside of the Coastal Nguni one. The relatively narrow distance across the orbits and the flattened face place the Voëlvlei crania very close to the KhoiSan mean, suggesting that they are most probably biologically related to the KhoiSan.

DISCUSSION

The Voëlvlei skeletons are both of mature individuals. The woman (Voëlvlei 1) was most probably in her 30's at death and was just beginning to show signs of degenerative joint disease in her vertebrae and hands. She was a tall woman with a calculated height in excess of 165 cm in a population where women were often less than 150 cm. Sometime during her life she had experienced facial trauma as shown by her broken and healed nasal bones. Voëlvlei 2, on the other hand, was a much more elderly person demonstrating advanced degenerative joint disease throughout his skeleton. This could be due to age-related changes, but it is possible that the osteological changes represent a specific disease process such as Diffuse Idiopathic Skeletal Hyperostosis (Aufderheide & Rodriguez-Martin 1998). Nearly all of his joints were affected in some way, and even the cartilaginous parts of his skeleton and his muscle origins and insertions were showing signs of excess ossification. Vertebral fusion had occurred in the mid-thoracic region limiting the rotational mobility of his back, but perhaps more significant in health terms was the extreme destruction of his cervical articular facet joints, a situation that must have been very painful. His teeth were very heavily worn, and although there was no dental disease as such, the heavy wear and associated calculus deposit had generated significant gum disease (periodontitis). A small osteological feature that may have some health significance is the presence of cribra orbitalia in the orbits of Voëlvlei 2. This is an overt sign of iron deficiency anaemia that is more commonly found in children and younger adult women but is often healed when found in adults (Larsen 1997). Patrick (1989) has shown that south Cape coast populations had a larger incidence of cribra orbitalia than inland populations and has speculated that a reliance on seafood may have

Fig. 6. Voëlvlei 2 – mandibular dental abscess.

Fig. 7. Voëlvlei 2 – arthritic damage to cervical vertebral articulations.

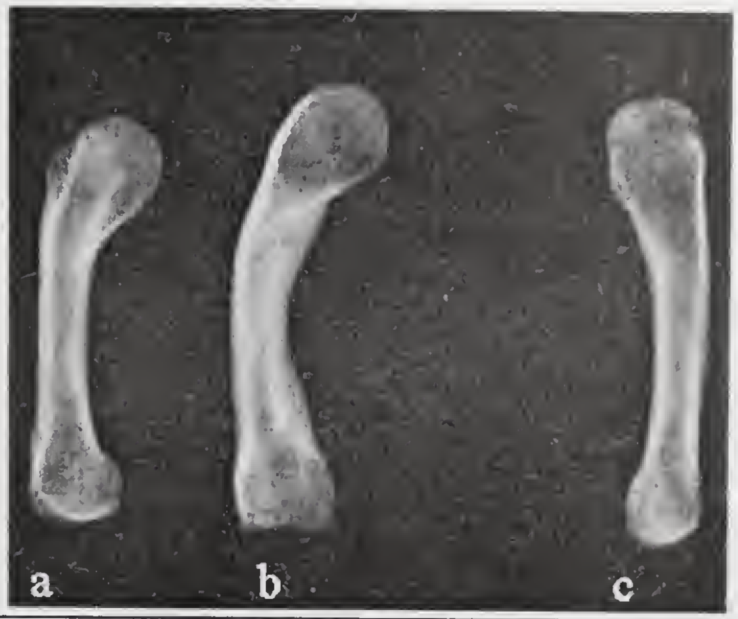

Fig. 8 (upper). Voëlvlei 2 metacarpals: a) left metacarpal 5, b) left metacarpal 4, c) right metacarpal 5.

Fig. 9 (lower). Voëlvlei 2 – radiographs of metatarsals: a) left metacarpal 5, b) left metacarpal 4, c) right metacarpal 5.

resulted in a higher parasite load. Prehistoric Inland Cape populations seem to have had a much lower frequency of cribra orbitalia (Peckmann 2003). Both individuals had habitually used a full squatting posture as seen in the signs of hyperflexion of the ankle joint.

The pattern of dental disease and wear of these two individuals is suggestive of a general hunter-gatherer or simple pastoralist lifestyle (Morris 1992). Only two carious teeth were noted of 42 teeth from the two individuals. This uncorrected rate of 4.8% carious teeth is above the hunter-gatherer threshold of Turner (1979), but well below the high rate of caries seen in the Oakhurst site near George (Patrick 1989, Sealy *et al.* 1992). Although the antemortem losses of the teeth of the two individuals were still low, the state of the alveolus of Voëlvlei 2 would have resulted in at least three of four further tooth losses had the individual lived just a few more years. The caries and antemortem loss incidence seen at Voëlvlei is higher than for Kalahari San and other inland populations, but this is explained by the lack of fluorine in the water sources of the southern Cape (Morris 1992; Sealy *et al* .1992) rather than a cariogenic dietary difference.

Anterior tooth wear is always more severe than posterior wear in foragers because the front of the mouth is used for purposes other than dietary mastication (Hinton 1981). This often manifests itself in rounded incisors that do not meet in occlusion, especially in people whose heavy tooth wear brings the incisors into edge-to-edge occlusion early in adulthood (van Reenen 1964). The rounded pattern of wear is not universal with age but without detailed ethnographic sources it is difficult to speculate as to what kind of non-dietary activity produces rounding (Morris 1992). Both of the Voëlvlei individuals share rounded incisors and temporomandibular joint arthritic changes. In the case Voëlvlei 2, osteoarthritic changes are present throughout the skeleton, but Voëlvlei 1 has very much milder post-cranial symptoms and the jaw changes may be unrelated. A speculation that warrants exploration is the possible linkage between rounded incisors, temporomandibular joint osteo-arthritis and the use of the front of the mouth for non-dietary purposes.

A key question that does arise from the description of these skeletons is to whether or not it is possible to differentiate between Khoekhoe and San. The radiocarbon

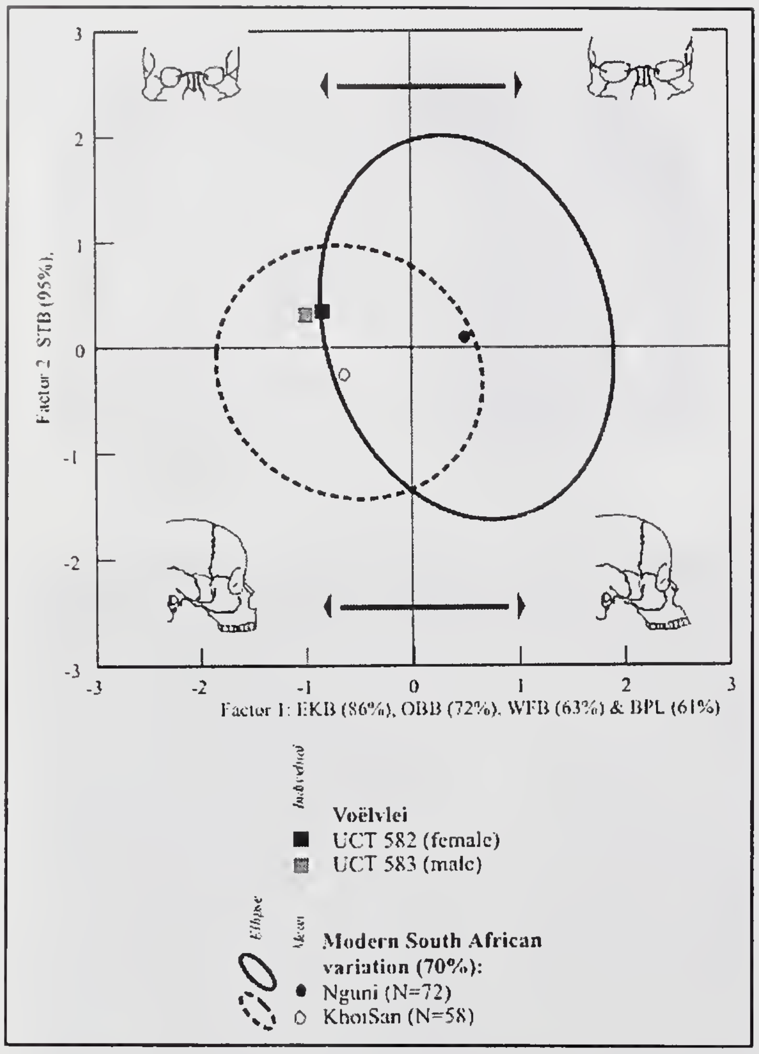

Fig. 10. Scatterplot of Regression Factor Scores for facial measurements.

dates place both of these individuals in the time period when herders and hunters were active in the region, but the limited archaeological information and lack of associated material culture provides no direct information about ethnicity. Despite that, there is some circumstantial evidence that could be used to marshal and argument that the skeletons were of Khoekhoe pastoralists rather than San hunters. The burial style was sitting upright with no grave goods, a style most frequently recorded in the historical literature for Khoekhoe populations (Inskeep 1986, Morris 1992). The stature, especially that of Voëlvlei 1, is significantly higher than for earlier hunter groups from the same region. Using femur lengths rather than reconstructed heights, Sealy & Pfeiffer (2000) have demonstrated south Coast individuals between 2000 and 4000 years ago were shorter and less variable than those who came before them and after them. Using reconstructed heights from maximum femur lengths, Wilson & Lundy (1994) also suggest that stature in the post-2000BP period was higher (male 1643 mm) than in the pre-2000BP period (1530 mm). Their reference data drawn from modern ethnographic data suggest an average male Khoekhoe at 162.4cm, San male at 155.8 cm and San female at 146.1 cm. The woman from Voëlvlei 1 exceeds even the Khoekhoe male average height, while the male from Voëlvlei 2 fits in the higher range of the San data and in the lower range of the Khoekhoe data.

Table 1: Cranial measurements (all measurements in mm).

	Voëlvlei 1 (UCT 582)	Voëlvlei 2 (UCT 583)
Maximum Cranial Length	195	191
Maximum Cranial Breadth	142	145
Basibregmatic Height	130	128
Bistephanic Breadth	113	114
Biasterionic Breadth	111	112
Frontal Sagittal Arc	142	137
Parietal Sagittal Arc	120	131
Occipital Sagittal Arc	142	118
Transverse Arc	301	303
Frontal Sagittal Chord	117	112
Parietal Sagittal Chord	107	114
Occipital Sagittal Chord	101	91
Nasion-Bregma Subtense	31	30
Nasion Subtense Fraction	49	47
Foramen Magnum Length	34	38
Foramen Magnum Breadth	28	28
Mastoid Height	20	26
Least Frontal Breadth	97	94
Bifrontal Breadth	97	96
Bizygomatic Breadth	122	127
Bimaxillary Breadth	97	98
Upper Facial Height	68	71
Nasion-basion Length	102	111
Prosthion-basion Length	95	95
Bimaxillary Subtense	27	25
Naso-frontal Subtense	21	17
Inner Bi-orbital Breadth	95	95
Outer Bi-orbital Breadth	103	106
Interorbital Breadth (Dac.)	25	23
Orbital Breadth	37	37
Orbital Height	30	30
Nasal Height	45	52
Nasal Breadth	27	28
Least Nasal Breadth	8	11
Maxillo-alveolar Length	51	50
Maxillo-alveolar Breadth	62	65
Palatal Length	41	43
Palatal Breadth	37	37
Palatal Height	8	7

The stature data remain unreliable especially because of problems in the use of standardized reconstruction formulae, but the carbon isotope data add more suspicion that the people may have been drawn from a pastoralist rather than a purely foraging population. Sealy (1997) and Sealy & Pfeiffer (2000) reported on a very small sample of three individuals from the period between 1000 and 400 years before present on the southern Cape. The ä^{13}C values (-12.4‰ for the three individuals) were enriched which did not surprise them as it was predicted that marine foods would make up a significant part of the diet. The accompanying ä^{15}N data were low in value suggesting instead that marine foods were not a major part of the diet. Their interpretation of these data was that the people of

Table 2. Mandibular measurements (all measurements in mm).

	Voëlvlei 1	Voëlvlei 2
	(UCT 582)	(UCT 583)
Bicondylar Breadth	108	
Bicoronoidal Breadth	92	93
Bigonial Breadth	87	91
Bimental Breadth	47	40
Proj. Height of Ramus	45	
Proj. Height of Coronoid	53	53
Proj. Length of Corpus	76	78
Proj. Length of Mandible	103	
Length of Condyle	17	
Breadth of Condyle	8	
Sigmoid Notch Subtense	21	
Minimum Width of Ramus	33	36
Symphyseal Height	36	32
Corpus Height at M2	26	22
Mandibular Angle (degrees)	123	

Table 3. Long bone lengths (all measurements in mm).

	Voëlvlei 1		Voëlvlei 2	
	L	R	L	R
Humerus(max)	303	307	308	
Radius (max)		234		
Ulna (max)	249	250		
Femur (max)	463	466		
Femur (physiol)	460	463		
Tibia (max)	390	388		
Fibula (max)	363	363		

these relatively recent times relied more on terrestrial C_4 foods or on animal products from grazing domestics. In their opinion this was not enough to confirm the skeletons as those of pastoralists, hunter-gatherers, or a mixture of the two. The two Voëlvlei individuals provide ä^{13}C values of -11.4‰ and -12.8‰, adding to the same enriched pattern seen in the data of Sealy and Pfeiffer. In comparison, the nearby 2375 year old male skeleton from Snuifklip (Morris *et al.* 1987) was short (only 149.0 cm in stature), had a less enriched ä^{13}C value of -14‰, and was fully consistent with other skeletons from Sealy's and Pfeiffer's data base of skeletons from the same timeperiod. When the relatively tall statures, enriched carbon isotope values and ethnographically Khoekhoe pattern of burial are considered together, the likelihood of a pastoralist and potentially Khoekhoe ethnic identity is substantially strengthened.

CONCLUSION

The two skeletons from Voëlvlei have given us a brief glimpse of life history in the period immediately before the European settlement at the Cape.

Voëlvlei 1 is the skeleton of a KhoiSan woman who probably died in her 30's. She was quite tall for an individual from a KhoiSan population, standing somewhere between 165 cm and 173 cm depending on the height reconstruction formula used. Her dental health was reasonable although she had lost two teeth due to caries and all of her teeth showed substantial occlusal wear. She was beginning to feel the impact of degenerative joint disease in her right hand and elbow, and especially in her lumbar vertebrae. The presence of a Schmorl's node on the inferior surface of her third lumbar vertebra suggests that discal degeneration was beginning. Sometime during her life she had broken her nasal bones.

Voëlvlei 2 was an elderly man who died somewhere in his 50's or even his 60's. He was shorter than the Voëlvlei 1 woman, but still relatively tall for a KhoiSan individual. He had advanced degenerative disease throughout his skeleton and must have had reduced mobility and pain from his neck and probably several other body joints. Although his teeth were healthy, they were heavily worn and he suffered from periodontitis.

The reconstructed statures, enriched carbon isotope values and upright burial style with no grave goods are strongly suggestive that both of these individuals were from a Khoekhoe pastoralist group rather than from a foraging San population.

ACKNOWLEDGEMENTS

Ms. Coreen Fourie, historian at Bartolomeu Dias Museum, was responsible for sending the skeleton to the Department of Human Biology for analysis and for providing the excavation records. Ms. Colette Scheermeyer at SARHA provided additional documentary information. Mr. Greg Flash provided the LODOX radiographic images.

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A LATE IRON AGE/CONTACT PERIOD BURIAL AT STAND 1610, HILLSIDE STREET SILVER LAKES, TSHWANE

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ABSTRACT

During June 2003, archaeologists of the National Cultural History Museum (NCHM) excavated a LIA/Contact Period burial located in the Silver Lakes Estate east of Tshwane. The recovery of the skeletal remains was done at the request of South African Heritage Resources Agency (SAHRA) Gauteng, who had been called in by a private home developer whose construction team uncovered the remains in a trench dug for a column. The burial is possibly associated with the remains of a Late Iron Age (LIA) stone walled settlement situated less than 100 m from the burial pit. The pit was in a midden, with a grey ashy layer and associated artefacts evidence of this. Associated grave goods included a mix of typically Iron Age and European artefacts, such as glass and copper beads, copper bangles and ankle rings, copper snuff holder/tinderbox and a set of two enamel bowls and a metal spoon. The exact age of the burial is unknown, but most probably dates to the period after the first Europeans moved into the area (late 1840's to mid 1850's). The remains belonged to a possibly female individual of older than 50 years. She had advanced dental disease and degeneration of the spine.

INTRODUCTION/BACKGROUND

During June 2003 the Archaeology Section at the National Cultural History Museum was informed by SAHRA Gauteng that a burial had been exposed during construction work on a private home in the Silver Lakes Estate to the east of Tshwane. The skeletal remains were found by workers who immediately informed the private developer, who in turn called on SAHRA. The archaeologists subsequently went to investigate, and it was decided to remove the skeletal remains through archaeological means in order to study it in detail.

As Iron Age-type pottery and glass beads were uncovered with the remains, and because some stone walling is situated nearby (less than 100 m), it was thought at first to be a burial of Late Iron Age (LIA) origin. Based on other grave goods recovered with the skeleton, it became evident that the burial probably belonged to the period of early European settlement in the area, during which LIA people came into contact with more recent settlers.

What follows is a discussion of the excavations and skeletal remains, as well as associated grave goods. The history of LIA and early European settlement in the area will also be discussed briefly to place the burial in context.

DESCRIPTION OF AREA AND SITE

The burial site is located in the Silver Lakes Golf Estate situated to the east of Tshwane (Fig.1), between 25.45.59S and 28.22.30.4E. The skeletal remains were uncovered in a pit dug for a column for the second story of a house on Stand 1610, Hillside Street. Other features and objects on the site and in close proximity to the burial pit include pottery, upper and lower grinding stones and stone walling. This stone walling, located on the foot of a low hill a short distance to the northeast, is indicative of earlier Late Iron Age settlement in the area. An electrified fence and brick wall separated these stone walls from the burial site.

LIA AND EUROPEAN SETTLEMENT IN THE AREA

Although detailed archaeological research has not been undertaken in the Silver Lakes area specifically, Tshwane

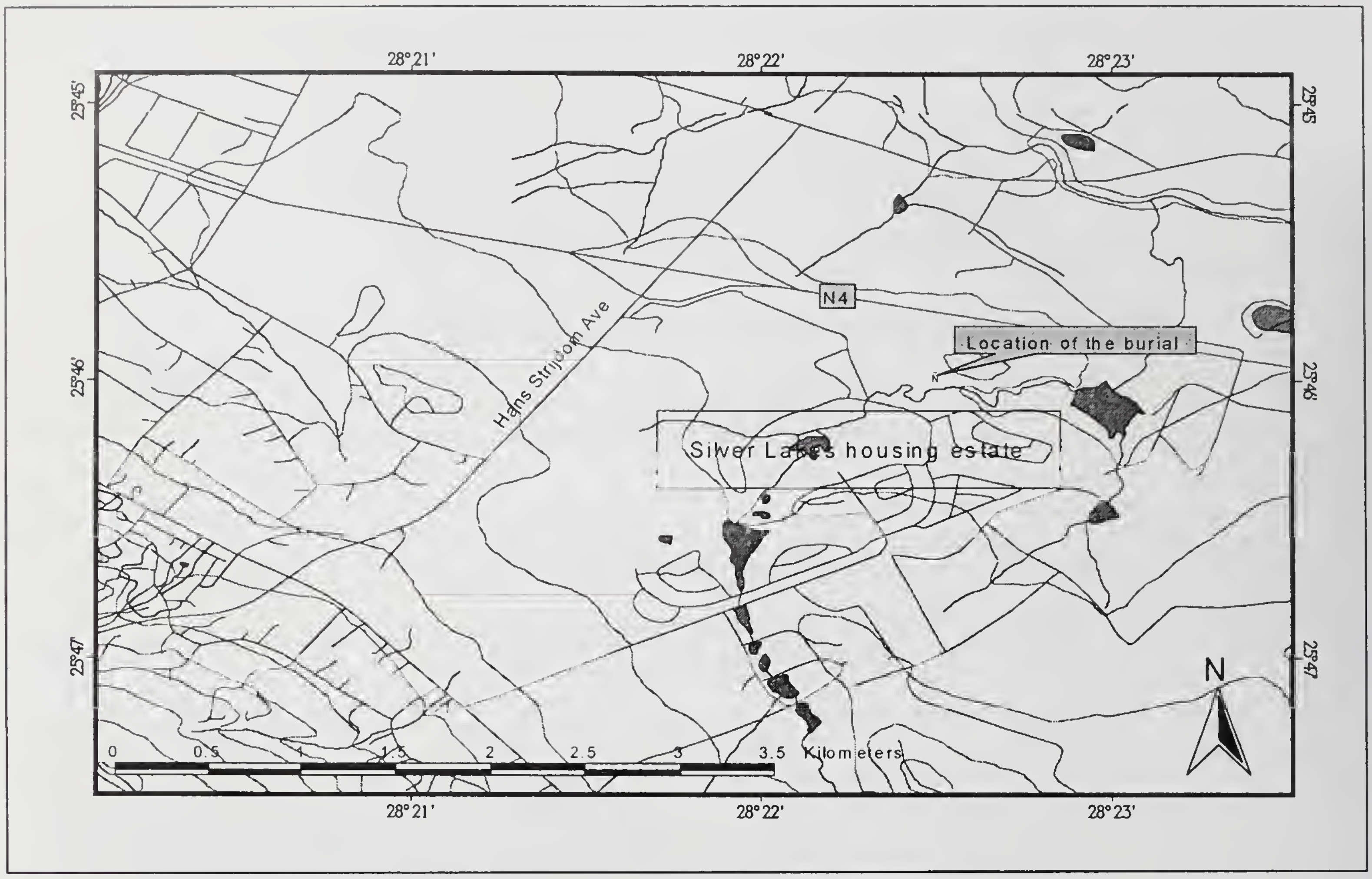

Fig. 1. Map showing the location of the burial site.

has a rich prehistory stretching back thousands of years to the Early Stone Age. For the purposes of this document we will, however, only concentrate on the Iron Age and historical European settlement in the area.

Before European settlement the area was inhabited by Late Iron Age groups of agro-pastoralists. The LIA in South Africa dates between the early 1600's and mid 1800's. Evidence for Iron Age settlement near the burial site is in the form of some low stone walling (cattle kraals, *etc.*) at the foot of a small hill northeast of the burial pit. It is quite possible that the stone walled settlements here and in the rest of the Silver Lakes area (the original farm Zwartkoppies 364 JR) have a Ndebele origin (Van Schalkwyk et.al.1996). Ethno historical investigation has indicated that Ndebele sites occur in the area, especially on the farms Hatherley, Zwartkoppies, Mooiplaats and Tierpoort (Van Schalkwyk *et.al.* 1996: 46-47).

The Southern Ndebele were most probably among the earliest Nguni-speaking people in the immediate area north of the Magaliesberg range north of Tshwane. The Manala-Ndebele, one of these Southern Ndebele groups, settled over a wide area towards the east of the present-day Tshwane, and it is possibly this group with which the stone walled settlements on Silver Lakes are associated (Van Schalkwyk *et.al.* 1996: 48). According to oral traditions the Manala chiefdom was destroyed by Mzilikazi around 1825. Survivors regrouped in scattered settlements or clusters of smaller settlements up to recent times, with many becoming labour tenants on white farms in the area (Van Schalkwyk *et.al.* 1996: 48).

During precolonial times the Manala-Ndebele settlements had a three-fold regional division, each occupied consecutively. The KoNonduna region, which included an undefined portion of Zwartkoppies 364 JR, was apparently occupied between circa AD 1747 and AD 1825 (Van Schalkwyk *et.al.* 1996:48-49). It is not certain whether or not the stone walls near the burial site are linked to KoNonduna.

Archaeological investigations on an Ndebele site on Hatherley, to the north of Silver Lakes, showed that differences and similarities exist between the Ndebele sites in the region. The sites on Zwartkoppies are not as extensive, in terms of stone walling, as those on Hatherley, while the amount of cultural deposit (ash, bone, pottery and glass beads) on some Zwartkoppies sites are more significant than elsewhere. Unfortunately, most of the sites on Zwartkoppies were destroyed by the development of Silver Lakes before archaeological investigations could be carried out (Van Schalkwyk *et.al.* 1996:50).

Historically speaking, Tshwane (old Pretoria) was established in 1855 by M.W. Pretorius, son of the Voortrekker Andries Pretorius. The town was named in honour of his father (SESA 1973, vol.9). Long before 1855, however, Europeans visited and lived in the area. The Scottish missionary, Robert Moffat, visited the area in 1830 on Mzilikazi's invitation, and became the first European to

describe the surroundings of Pretoria (Collier 1965:2). In 1835, the scientist and explorer, Dr.Andrew Smith, also visited the Magaliesberg. Finally, in 1838, Lucas Bronkhorst built the first house in Pretoria, situated in Fountains Valley. He was the brother of Gerhard Bronkhorst, secretary to Voortrekker leader Andries Potgieter, with whom he journeyed through Daspoort and Wonderboompoort in August 1836. Gerhard also built a house in Fountains Valley, a year after his brother. Only in 1848 did more people move in, with the Fourie trek comprising six families settling in the area of the present-day Burgers Park (Collier 1965:3, 6).

To go into further detail regarding Tshwane's early history is unnecessary. What is clear is that Iron Age people, probably Manala-Ndebele, lived in the Silver Lakes area long before the first Europeans settled here. The contact between the two groups occurred after 1830 and after Mzilikzi moved away. Many started working on white-owned farms after 1855. The skeletal remains and grave goods from Silver Lakes are evidence of this contact.

EXCAVATION RESULTS

Burial

The burial pit (Fig. 2) seems to have been dug in a midden, as an ashy layer was exposed in the pit. Skeletal remains (Fig. 3) started appearing approximately 52 cm below this ashy layer, with the total depth of the pit (including fill and concrete slab) being 1.34 m.

The individual was buried lying on its left side, in the semi-flexed or foetal position, in an east-west direction with the head towards the north. The total length of the burial was 52 cm (east-west) and the width 23 cm (north-south). A large stone was placed in the grave, with the individual's head resting on it.

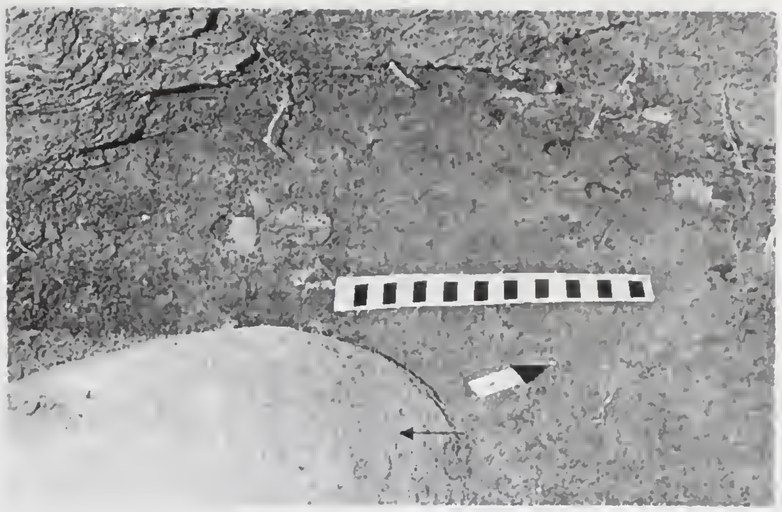

Fig. 2. Silver Lakes Burial Pit - Note the large stone (indicated by arrow) used to rest the head on.

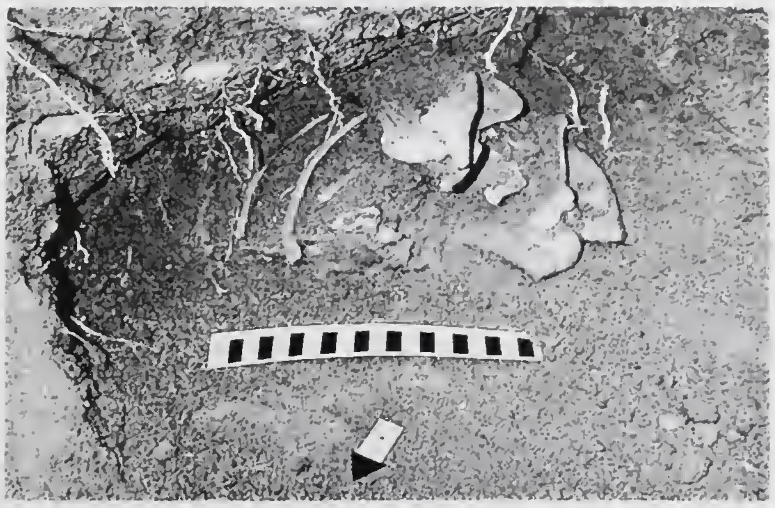

Fig. 3. Silver Lakes burial. Due to the difficult position in which the pit was located, the complete skeleton could not be photographed *in situ*.

Grave Goods

A fairly large amount of cultural material, or associated grave goods, were recovered with the skeletal remains. Although some of these artefacts might only be related to the midden in which the burial was placed, most are believed to be the personal effects of the deceased. The grave goods are divided into the following categories.

Ceramics

Fourty-one fragments of a small vessel, probably a bowl or drinking cup, were recovered from the burial. The vessel was unfortunately broken during the construction work on the house, and is too fragmented to determine size or specific shape. It is undecorated, but has black coloured burnish (ochre or haematite) on both its inner and outer surfaces. Because the vessel was found near the head of the individual, we believe it to be associated with the burial and not the midden the burial was placed in.

Glass beads

A large number of glass beads (127 in total), representing three different types of beads (Figs 4 -6), were found with the burial. Of these, 100 were opaque aqua blue circular wound beads (Kinahan 2000:58, 115), 17 were dark blue hexagonal drawn beads (Kinahan 2000:57, 113), the so-called Venetian trade beads, while a further 10 (represented by 47 fragments) were also circular wound beads, but of a different shade of blue.

Most of the beads came from the burial pit, located near or on the neck of the individual, although some were recovered (sieved out) in the rubble taken from the pit. It is presumed that the beads were strung around the persons' neck when the burial took place, the string unfortunately long since gone.

The beads found with the burial were used during Iron Age times as trade items, and might have been passed on from one owner to another over generations. This makes the dating of the burial, and the site, problematic. The drawn beads (dark blue hexagonal type) are similar to ones found on other Iron Age sites in southern Africa, e.g. the !Khuiseb Delta in Namibia, dating to between the 2nd half of the 18th century and the late 19th century (Kinahan 2000). The wound types were also found on Namibian sites, and date to the early 20th century.

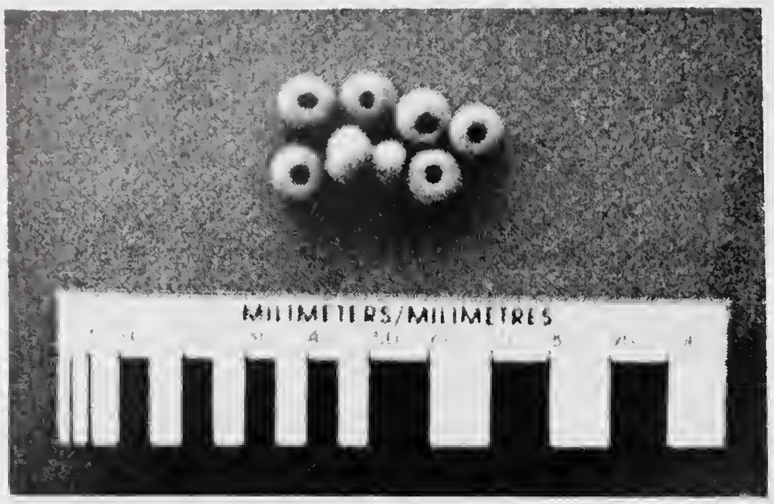

Fig. 4. Glass beads - Type 1: Opaque aqua blue circular wound beads.

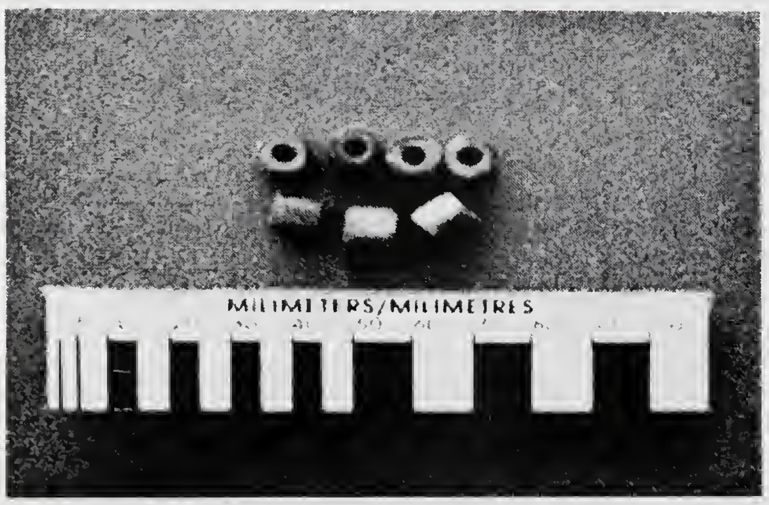

Fig. 5. Glass beads - Type 2: Dark blue hexagonal beads.

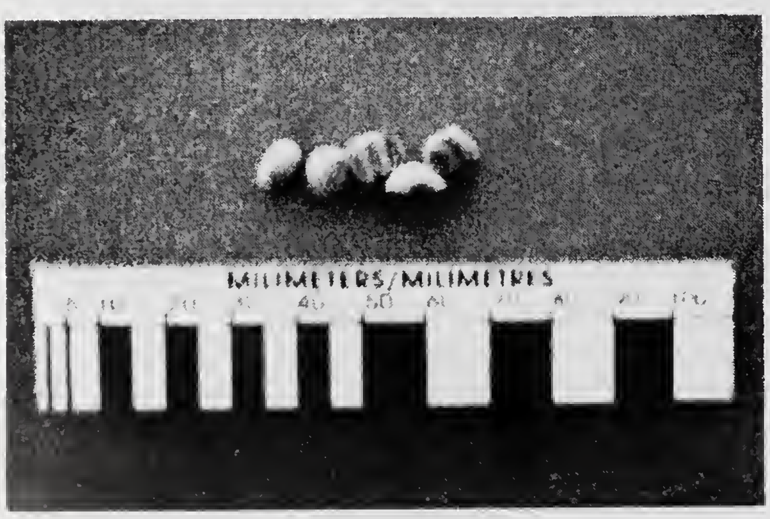

Fig. 6. Glass beads - Type 3: Light blue circular wound beads.

It is therefore possible that the site, and probably also the burial, date to between the mid/late 1700's and early 1900's. However, because glass beads have a fairly long 'life span', and were passed on for generations, this is only a relative age determination. Dating the skeletal remains more accurately will depend on the C14 analysis of the bones. This will provide a radiocarbon age, and could give us a better indication of when the individual lived and died.

Metal artefacts

A wide variety of metal artefacts were recovered from the burial pit. These include copper bangles, copper beads and a set of enamel bowls with a spoon.

Copper arm bangles and ankle rings

A number of copper arm bangles were found with the skeletal remains (Fig. 7). A single bangle was on the right arm of the individual, while approximately ten were around the left arm. Due to heavy corrosion the exact number of bangles on the right arm could not be determined. The bangles have a diameter of 60 mm, and are on squared pieces of copper about 0,4 mm thick. The ends of the bangles are rounded.

Two large copper ankle rings (Fig. 8), one on each leg, were also recovered. They are both approximately 87 mm in diameter and on a rounded piece of copper 0,3 mm thick. The ends of both have also been rounded.

Copper beads

Two types of copper beads were recovered with the skeletal remains. The first is a small string, very fragmented and corroded, of beads (a coiled helix), strung around strands of animal tail hair. The beads have a diameter of less than 1.5 mm. The second is a string of large copper beads, 51 in total, strung around a piece of khaki coloured cloth (Fig.9). The string has a length of 163 mm. Each bead is 5 mm in diameter and has a thickness of 2 mm. The beads were manufactured by cutting strips of copper and folding them into rounded beads. The copper bead strings were probably worn around the neck, or arms, of the individual.

Copper snuff holder or tinder box

This is one of the most interesting objects (Fig.10) recovered with the skeletal remains. The object has a cylindrical shape, with a diameter of 13 mm and length of 75 mm. It is wrapped in a piece of khaki coloured cloth, similar to fragments of cloth found with the copper bangles and elsewhere on the skeleton. It has a lid 23 mm long that fits over the rest of the cylinder. There are two 'eyes', one at each end, which were probably used to thread string through in order to hang it around the individual's neck.

The exact function of the artefact is not clearly defined yet. It might be a tinder box (tonteldoos), used to keep fire making materials such as flints and tinder in to keep it dry (J. Middeljans, pers.comm. 2003), or more likely, a snuff holder (J. van Schalkwyk, pers.comm. 2003). The real function might only be determined once the object is opened. Although it is fairly well preserved, we do not want to open it in fear of damaging it.

Set of enamel bowls and spoon

A set of two white coloured enamel bowls, with a metal desert spoon (Fig.11), was also recovered. Although these artefacts were not found with the skeletal remains (they came from the rubble taken out of the pit by the builders), it is presumed that they were placed on top of the grave or

Fig. 7. Copper arm bangle from the burial.

Fig. 8. Copper ankle rings.

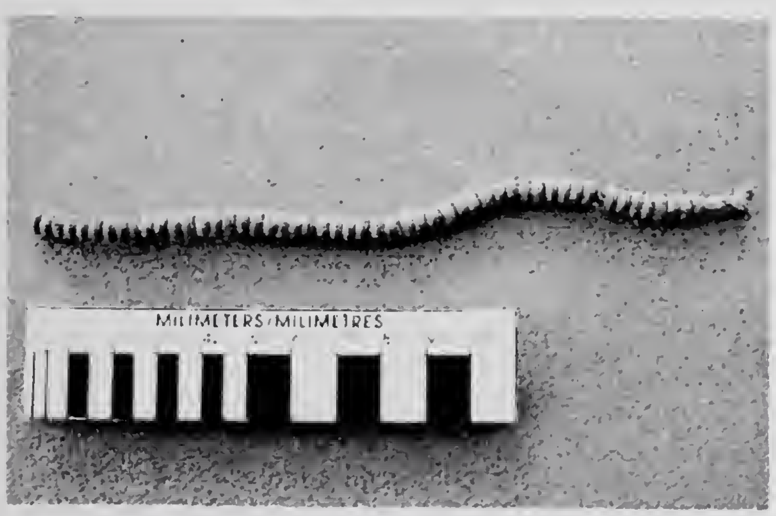

Fig. 9. Copper beads strung on khaki-coloured piece of cloth.

buried with the individual. Eating and drinking utensils (such as drinking cups or bowls) were buried with the deceased during Iron Age and later times.

The smaller of the two bowls had a diameter of 160 mm and stands 65 mm high. It is round, with a flat base, and has

Fig. 10. Copper snuff holder or tinderbox. Note khaki cloth wrapped around it.

Fig. 11. Set of enamel bowls and spoon.

a ridge near the bottom of the bowl that goes right around it. The bowl also has two small handles, rectangular in shape, opposite each other. The large bowl is 185 mm in diameter and stands 75 mm high. It is round with a base that tapers downwards. The spoon is 190 mm in length with the ladle 45 mm wide. It has a heart-shaped pattern on the haft that is similar to decoration found on spoons recovered at historical archaeological sites such as Minnaar Street (Pelser *et.al.* 1998) in Tshwane, which dates to the late 19th/early 20th centuries.

Clothing

A number of small fragments of clothing were recovered with the skeletal remains. Most of the clothing fragments were found attached to the copper artefacts, although some pieces came from the burial pit itself.

Five types of cloth were identified from the fragments. The first, a machine woven, khaki-coloured cloth, was

found wrapped around the copper snuff holder, while similar cloth was used in the string of large copper beads. The second type is a khaki and white coloured machine woven cloth, found on both of the ankle rings and one of the copper bangles, while the third is also a machine woven cloth, light and dark brown in colour, with a triple band of light brown stripes for decoration. A green coloured woven cloth was also identified, although this might only be the result of the copper artefacts oxidizing over the years. The last type is hand woven, dark brown, grass matting. Pieces of khaki cloth adhere to it.

The largest mat fragment has a length of 60 mm and is 35 mm wide, while the biggest cloth fragment is 42 mm long and 27 mm wide. Because the fragments are so small, it is difficult to determine their origin, and is therefore impossible to date. The individual was probably placed on top of the hand woven grass mat for burial, and might have been dressed in his clothes. The copper artefacts were possibly wrapped in cloth simply to protect them, although a ritual or symbolic reason is also possible.

Other cultural material

A number of artefacts not related to the burial were also recovered from the burial pit area. Some of these came directly from the pit (associated with the midden), while a few were found in the rubble removed from the pit by construction workers.

Stone Age material

Eight stone tools, dating to the Middle and Late Stone Age, came from the pit and the immediate area around it. These included some scrapers and other flake-tools.

Iron Age material

This included a large upper grinding stone that might also have been used as hammer stone, as well as 23 pieces of undecorated pottery. The pottery fragments represent at least three individual vessels. Faunal remains, associated with the midden in which the burial pit was dug, were also found. Of these, 20 pieces were unidentifiable bone flakes and enamel fragments. There was one identifiable tooth (a molar), representing cattle (*Bos taurus*).

Historical material

The only artefact in this category is an old, rusty pocket knife (Fig.12), broken into three pieces. Although the knife might have belonged to the individual buried here, it is very difficult to determine because it was not found associated with the skeletal remains. The age and origin of the knife could also not be determined.

The pocketknife had a single blade, 80 mm long, with the knife handle 97 mm long.

Skeletal remains

The skeletal remains were fairly well preserved, and a detailed study was possible. The remains consist of the bones of one human individual.

The skeleton is nearly complete, and comprises of a skull and mandible, a complete set of vertebrae, most of the ribs, the pelvis and long bones. All the major long bones are present, most of them complete. The skull suffered damage during the discovery/excavation, and could only be partially reconstructed. Some hand and foot bones were also found, although not all. A cluster of copper and iron bangles holds the left radius and ulna together, with some cloth adhering to it. They were left as such.

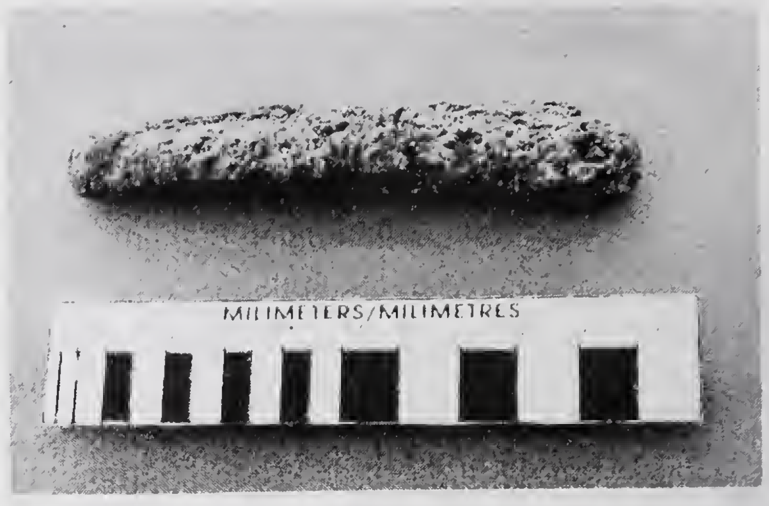

Fig. 12. Pocket knife from the site.

The skeleton is clearly that of an adult. All long bone epiphyses are closed, as are many of the cranial sutures. Most of the coronal suture and part of the sagittal sutures are completely obliterated. The teeth are very worn, and in some of them only the roots are remaining. Many of the sternal ends of ribs have large outgrowths (Oettlé & Steyn 2000). Large osteophytes are present on especially the lumbar vertebrae, and the sacrum and ilia show signs of partial fusion. These features indicate an individual of older than 50 years (Ferembach *et al.* 1980, Krogman & İşcan 1986).

The sex was difficult to determine, as many of the characteristics are ambiguous. Although the sciatic notches are fairly narrow (a male characteristic), the subpubic angle is wide, the pubes have a rectangular shape and prominent pre-auricular sulci are present. The sacrum is wide. The mastoids are intermediate in size, as are the glabella. The supraorbital rims are sharp and the forehead vertical. As much dental pathology is present, the mandible could not be used. The individual was most probably female (Ferembach *et al.* 1980; Krogman & İşcan 1986).

The long and narrow skull and morphology of the nose indicate an individual of South African Negroid origin (De Villiers 1968). The cranial and mandibular measurements that were possible are shown in Table 1 (Buikstra & Ubelaker 1994).

For reconstructing the stature, the formulae of Lundy & Feldesman (1987) were used. This person was about 151.5 ± 2.789 cm tall, as calculated with the physiological length of the femur. This is average to short for a South African Black woman (Tobias 1972). Postcranial measurements can be seen in Table 2.

Dental analysis is very difficult due to the presence of advanced dental disease and many fragmentary teeth. In the maxilla, the right second molar, both central incisors, the

Table 1. Measurements of skull and mandible of the Silver Lakes burial (Buikstra & Ubelaker 1994).

Dimension	mm
Max. cranial length	±186.0
Max. cranial breadth	±133.0
Basion-bregma	±136.0
Biauricular breadth	114.0
Min. frontal breadth	98.0
Upper facial breadth	104.0
Frontal chord	119.0
Foramen magnum length	32.0
Foramen magnum breadth	26.0
Chin height	±34.0
Breadth of the mandibular body	11.0
Bigonial width	97.0
Bicondylar breadth	121.0
Min. ramus breadth	33.5
Max. ramus breadth	39.0
Max. ramus height	52.0
Mandibular length	78.5
Mandibular angle	125.0

right lateral incisor as well as the left first and second molars seem to have been lost before death. The left third molar is postmortem absent. Dental abscessing is present at the roots of the right first molar and left canine and first premolar. The teeth are severely worn, especially the anterior teeth. In some cases only the roots are remaining.

In the mandible, the right first molar, right central incisor and left second premolar were lost antemortem. A dental abscess is present at the root of the right second molar, and a carious lesion can be seen on the left second molar. These teeth are also very worn.

The pattern of dental wear is unusual. Many of the lower teeth are very worn on their anterior sides, indicating a degree of overbite. The irregular and inconsistent wear patterns may indicate that the teeth were used for purposes other than chewing. Due to the advanced wear, no measurements were possible.

Enamel hypoplastic lines are visible on the left lower canine and right upper canine. The other teeth could not be assessed due to the advanced wear and presence of calculus. Enamel hypoplastic lines are usually indicative of acute episodes of disease and/or malnutrition during childhood (Goodman & Rose 1990). No cribra orbitalia is present. Advanced pathology of the spine is present. In the cervical vertebrae degeneration of intervertebral discs led to erosion of the vertebral bodies, many of which are also flattened with large osteophytes. Osteophytes are also present on the thoracic vertebrae, with a partial collapse of the body of T11. All lumbar vertebrae also show large osteophytes, while the L1 are collapsed. This individual would have had advanced kyphosis and would have had difficulty in walking upright. Partial fusion of the sacro-iliac joints is also present. Although there are many pathological changes in the back,

Table 2. Long bone measurements of the Silver Lakes burial (Buikstra and Ubelaker 1994).

Dimension	mm
Clavicle	
Length	126.5
Diameter: antero-posterior	13.0
Diameter: supero-inferior	9.5
Scapula	
Height	138.5
Breadth	109.0
Humerus	
Maximum length	283.5
Epicondylar breadth	58.5
Vertical head diameter	39.5
Max. diameter at midshaft	21.5
Min. diameter at midshaft	17.5
Radius	
Maximum length*	238.0
Diameter: antero-posterior *	10.5
Diameter: medio-lateral*	14.0
Ulna	
Maximum length*	261.0
Diameter: antero-posterior*	13.0
Diameter: medio-lateral*	16.0
Physiological length*	232.0
Min. circumference*	30.0
Sacrum	
Anterior length	104.5
Ant-sup breadth	102.0
Max diameter base	60.0
Os coxae	
Height	183.0
Iliac breadth	145.5
Pubis length	73.0
Ischium length	75.0
Femur	
Maximum length*	416.5
Bicondylar length*	412.0
Epicondylar breadth*	75.5
Max. diameter of head*	41.0
Ant-post subtrochanteric diameter*	23.5
Med-lat. subtrochanteric diameter*	30.0
Ant-post midshaft diameter*	29.0
Med-lat midshaft diameter*	24.0
Midshaft circumference*	81.5
Tibia	
Maximum length	365.0
Max. prox. epiphyseal breadth	69.5
Max. dist. epiphyseal breadth	42.5
Max. diameter nutrient foramen	28.0
Med-lat. diameter nutrient foramen	24.0
Circumference nutrient foramen	81.0
Fibula	
Maximum length*	347.0
Max. diameter at midshaft*	17.0
Calcaneus	
Max. length*	78.0
Middle breadth*	40.0

*measured on right side, max.=maximum, ant=anterior, post-posterior, med-medial, lat=lateral

the condition of the bone is generally good. This may indicate strenuous labour during life.

DISCUSSION & CONCLUSIONS

The recovery of the skeletal remains from the burial pit in the Silver Lakes Estate has provided archaeologists from the NCHM with the opportunity to reconstruct in some small part the earlier history of this area. Previous research in the area (before the extensive housing development started) has been limited to a few superficial cultural resource surveys.

The skeletal remains found are those of a possibly female individual who had been older than 50 years of age and about 1.52 m tall. She had advanced dental disease, with many abscesses and antemortem losses. Degenerative disease of the vertebral column is also evident, which may be related to strenuous labour during life.

Although the skeletal remains and burial pit are related to the Late Iron Age stone walled settlement in the vicinity, some of the associated grave goods clearly point to contact between the Iron Age communities and early European settlers in the area. The glass beads, copper arm and ankle rings, copper beads and pottery are all typically Iron Age artefacts, while the set of enamel bowls and spoon, the snuff holder and clothing have a mainly European origin. Without a radiocarbon age available for the remains and the burial, it is difficult to place the individual within the right time frame. However, based on the European-type artefacts the burial definitely took place after the first Europeans started moving into the Tshwane area (late 1840's to 1850's). The individual might have b before Tshwane was established. Without proper historical een a farm worker, or tenant, living in the Iron Age stone walled settlement, on the white-owned farm. The individual might also have obtained these objects through trade, long information, including oral traditions, available, we might never know the true story.

Interpreting the associated cultural material was much easier. The glass and copper beads, as well as the copper bangles and ankle rings, were used for personal adornment, and probably belonged to the person in life. Besides being used for decorative purposes, these artefacts, and especially the glass beads, were also used as trade items.

The copper snuff holder or tinderbox is more difficult to explain. It was probably hung around the neck of the individual, and was used in purely functional manner (using snuff or making fire), although some ritual meaning can also be ascribed to it. The ritual aspect does need more detailed research however. Although some pottery was found with the skeletal remains, it was not possible to reconstruct the vessel represented by the pieces. It was possibly a small bowl or drinking cup. The set of enamel bowls and spoon are also associated material. In Late Iron Age burials grave goods, such as ceramic pots and bowls, are sometimes found. The European metal artefacts are therefore a simple continuation of traditional burial practises, and not a replacement.

To conclude, the burial at Silver Lakes probably dates to between the mid and late 19th century, after Europeans moved into the Tshwane region. The stone walled settlement situated not far from the burial pit is probably related, indicating that the individual lived here while possibly working on the white-owned farm as labourer. Dating the remains and the burial are problematic, as no C14 date is available at present. The Iron Age and European artefacts do, however, give us a relative age estimation.

To properly understand the remains and burial, and place it into the context of the LIA settlement and the European presence in the area, more research is needed. This would entail both archival and literary research, as well as oral traditions and archaeological excavations. This work has to take place before all cultural remains are completely destroyed.

Over the years several Late Iron Age graves have been found on the Eastern side of Pretoria. In April 1997 the skeletal remains of two human individuals were found by construction workers on plot 200, Willow Glen. Both individuals were females of South African Negroid origin, respectively about 20-35 and 15-20 years of age. A sample of bone from one of the skeletons (UP 72) yielded a radiocarbon date of 180 ± 45 years BP (Pta-7369). Indications of stonewalls, an ash midden and a stock enclosure were also found at the site (Nienaber *et al.* 1998).

Another skeleton was found a few years ago by Meyer (Dept. of Anthropology and Archaeology, University of Pretoria) at the Anglo-American development at Swartkoppies (now Silver Lakes). This skeleton is housed at the Deptartment of Anatomy, University of Pretoria.

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Southern African Field Archaeology **13 & 14**:36-41. 2003/2004.

"DE-!KUNGING" THE LATER STONE AGE OF THE CENTRAL INTERIOR OF SOUTH AFRICA.

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ABSTRACT

This contribution has as its point of departure a project on the Later Stone Age (LSA) based on the Ghaap Escarpment area during the 1970s (Humphreys 1979). Following the trend at the time, use was made of Kalahari analogues in trying to make sense of the excavated material. With the benefit of hindsight, it will now be argued that the use of Kalahari analogues is inappropriate to the understanding the LSA archaeological record in the central interior of South Africa. This is because the ethnography generally used reflects 'aberrant' hunter-gatherer behaviour patterns that cannot be projected back uncritically into the past. It will be suggested that, if 'modern' analogues are to be used, the Australian Aborigines are possibly more relevant as they were 'pristine' hunter-gatherers until European colonisation in that there was not an intervening period of contact and interaction with indigenous herding and mixed farming communities.

INTRODUCTION

During the 1970s I undertook excavations in a series of small Later Stone Age (LSA) rock shelters located along the edge of the Ghaap Escarpment (Fig. 1).The results from these, as well as other material, formed the basis of a Ph.D thesis (Humphreys 1979). Underlying the arguments presented in the thesis were two main concerns - a) lithic patterns as a reflection of 'culture history' and, b) the identification of possible evidence for seasonal mobility. This latter endeavour was in the forefront of many research efforts at that time, following upon the seminal paper by Parkington (1972): "Seasonal mobility in the Late Stone Age". Parkington's model was, in turn, inspired by Richard Lee's work on the !Kung in the Kalahari which was, itself, very influential at the time - and continues to be so, despite the fact that a wide range of groups have now been the subject of intensive research (see, for example, Mitchell 2002:223).

Leaving aside the lithic patterns for the moment, the net result of my research efforts was that I was unable to identify any evidence for seasonality and I attributed this to what I called a 'uniform environment' where human subsistence needs operated 'below' any ecological constraints (Humphreys 1979). This I contrasted with 'seasonal resource zonation' (*i.e.* summer versus winter) in the Kalahari and 'spatial resource zonation' (*i.e.* contrasting adjacent ecological zones) in the Western Cape where, I suggested, 'stress points' led to migratory pressures or incentives (Fig. 2).

The 1980s saw the intensification of the 'Great Kalahari Debate' and, along with it, I became more sceptical about the use of Kalahari analogues. I was intrigued by a remark by Donald (1987) to the effect that, "There is the very real possibility that much of !Kung 'harmlessness' is the result of !Kung 'helplessness', *i.e.* one of the outcomes of defeat. It is quite possible that current !Kung social behaviour (and that of many - all? - other extreme egalitarians) is the product of devolution rather than evolution". As a part of my reassessment of the 'Kalahari scenario', I looked more closely at the rainfall patterns of Maun (representing,

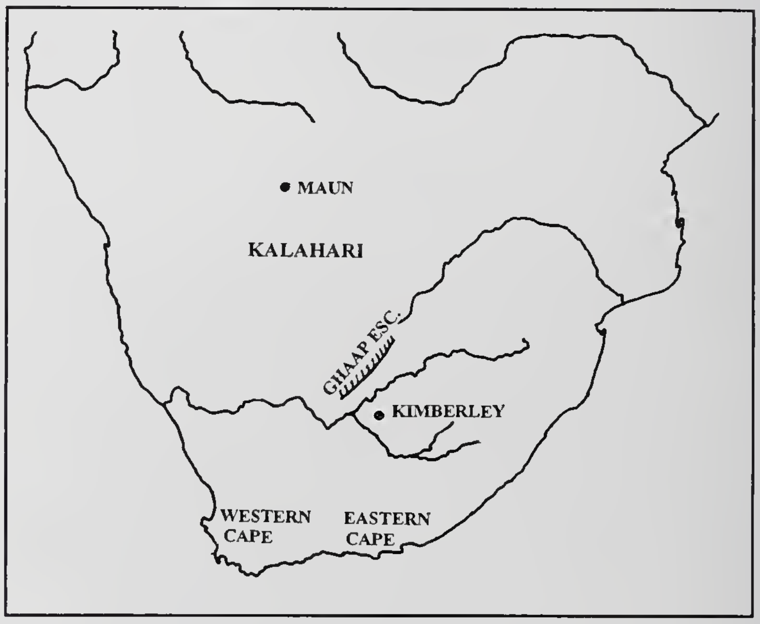

Fig. 1. The approximate location of places and areas mentioned in the text.

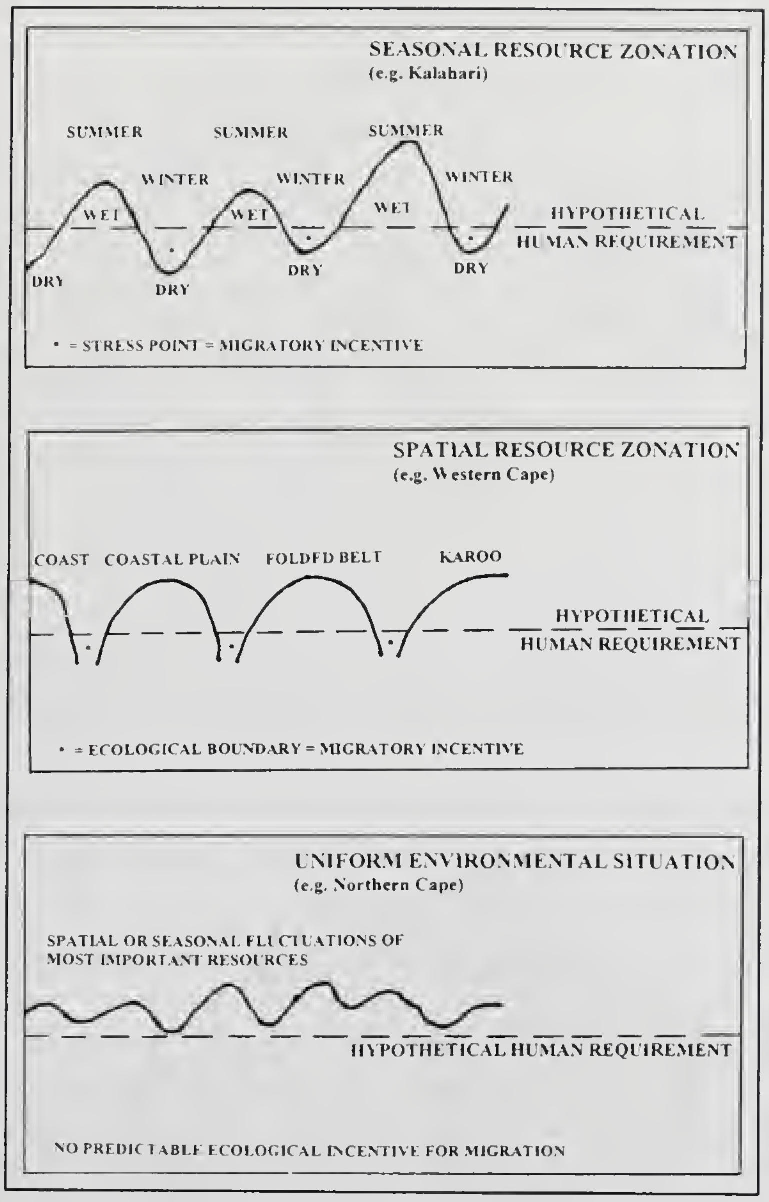

Fig. 2. Hypothetical responses to resource zonation in the Kalahari, Western Cape and Northern Cape.

probably most closely, the Kalahari) and Kimberley and found them to be very similar; indeed, Kimberley suffered 'severe drought' more often than Maun (Humphreys 1987). While the environment is clearly more than simply rainfall, it is worth noting that Biesele (1971:65) and Lee (1979:312) both point out that it is water and not the presence of game or plant resources that is the primary reason for mobility patterns among the !Kung and G/wi. I wondered, therefore, why seasonal mobility existed in the modern Kalahari but, apparently, not in the prehistoric Northern Cape - or, as least, so far as my research had been able to detect. I thus posed the question: "Prehistoric seasonal mobility: what are we really achieving?" and suggested that perhaps we were looking for something that did not exist. From then on I have still been wondering, have we actually got it wrong by using 'aberrant' hunter-gatherer patterns from the Kalahari and projecting them back into the LSA - in short, creating a skewed past in the image of the modern !Kung? There have been several developments which now suggest to me that we have been misguided in this endeavour and I want to address some of them briefly here as food for thought rather than as providing a definitive answer to the question.

A BRIEF DETOUR TO AUSTRALIA

I want to suggest that if we are looking for more appropriate modern hunter-gatherer analogues in trying to understand the LSA, we should turn to the Australian Aborigines. At the outset I must, however, first preface my remarks with the following observation by Bailey (1980:340): "It is à increasingly obvious that Aboriginal society was not static, and that contemporary observations and analogues cannot be extrapolated indefinitely into the past but must be complemented by independent archaeological evidence".Thus, even here we are not 'safe' but we are, I believe, 'better off'.The point about the Aborigines is that they were 'pristine' hunter-gatherers until European colonisation to the extent that there was not an intervening period of contact and interaction with indigenous mixed farming communities, as was the case in southern Africa. There is, therefore, no hunter-gatherer/pastoralist interaction and accompanying identity issues *a la* Smith (*e.g.* 1990), no hunter-gatherer/agriculturalist interaction *a la* Jolly (*e.g.* 1996) and no pre-colonial marginalisation as some revisionists have, probably quite correctly, suggested for southern Africa (*e.g.* Gordon 1992, though the literature is extensive).Thus, when contacted, the Australian Aborigines are likely to have exhibited a pattern more appropriate to southern African hunter-gatherers at, say, 2 000 plus years ago than the San even at the time of their first contact with Europeans, let alone from the mid-1960s. In short, the Aborigines are a more appropriate source of analogues for the LSA than are modern Kalahari hunter-gatherers.

Let us examine this proposition.The first permanent European settlement in Australia was established at Sydney in 1788.The first settlers were convicts rather than colonists but the first free settlers were to arrive in 1793.The first exploration beyond the eastern mountains (the Great Dividing Range) took place in 1813 (at a time, incidentally, when William Burchell and others were exploring the area north of the Orange River). What did these first colonists find?

The Australian Aboriginal population was estimated at some 250 - 300 000 people who spoke upwards of 500 languages and dialects; of these about 200 were "mutually unintelligible ... as different as Russian and English" (Flood 1983:196; see also Clark 1983:39 and Ucko 1983:31).These groups were, and are, described as 'tribes' which are "characterised by possession of a common language, territory, identity and culture" and number around 500 individuals (Flood 1983:181). It is, however, acknowledged that 'tribe' is an inaccurate term in that it implies a form of political organisation that never existed in Australia; it is used, for want of a better term, to refer to a "major landowning group" (Australian Info International 1989:14). Aboriginal 'tribes' were enormously diverse - the only common element was a dependence on hunting and gathering. They even still differ physically as a result of their adaptation to the various environments (Farb 1978:225 -6). This diversity - linguistically and physically - reflects a high degree of territoriality. Indeed, Radcliffe-Brown

(1918) noted that some of the 'tribes' he studied were prepared to defend their territorial boundaries by force. Beattie (1964:3) has observed that "... a stranger who cannot prove that he is kin to the group, far from being welcomed hospitably as a fellow human, is regarded as a dangerous outsider and may be speared without compunction". Flood (1983:224) has even stated that, "It has been suggested that new elements such as agriculture (from New Guinea) did not penetrate prehistoric Australia because of hostility on the part of the Aborigines to new-comers".

Today much of this pre-contact diversity has disappeared in the face of colonisation but major culture areas can still be identified (Fig. 3; Flood 1983:193).Yet, interestingly, when we look at the lithics going back to the time when high diversity seems to have been even more pronounced, we find that such diversity does not show up in the archaeological record (Fig. 4; Flood 1983:187). This must reflect a problem that exists in South Africa as well as Australia, namely, that our studies of lithic patterns are too crude and that our level of analysis does not highlight major social and territorial differences that might have been there. Mithen (1996:149) has put it neatly with reference to the Early Stone Age but it surely applies equally in principle to the LSA: "As archaeologists we are left with a million years of technical monotony that mask a million years of socially and economically flexible behaviour". I return to this point below.

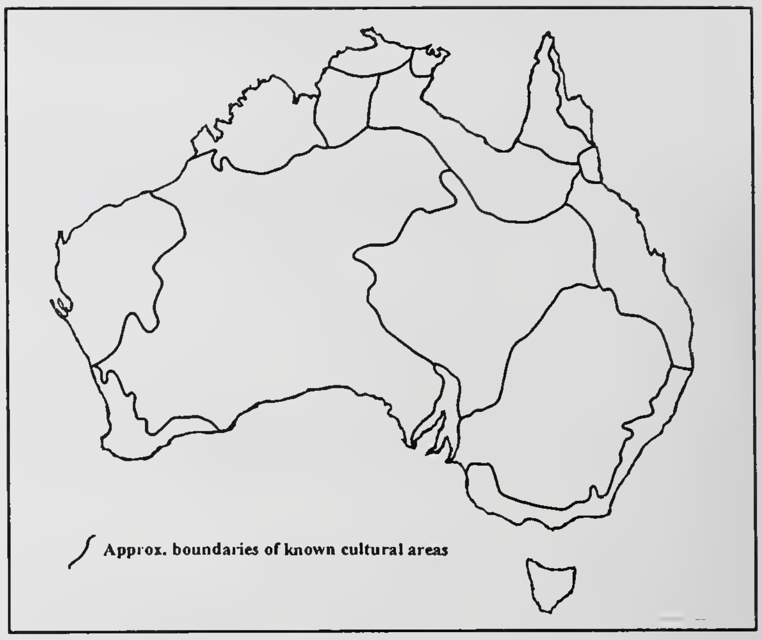

Fig. 3. Approximate boundaries of known cultural areas in Australia (simplified from Flood 1983:193).

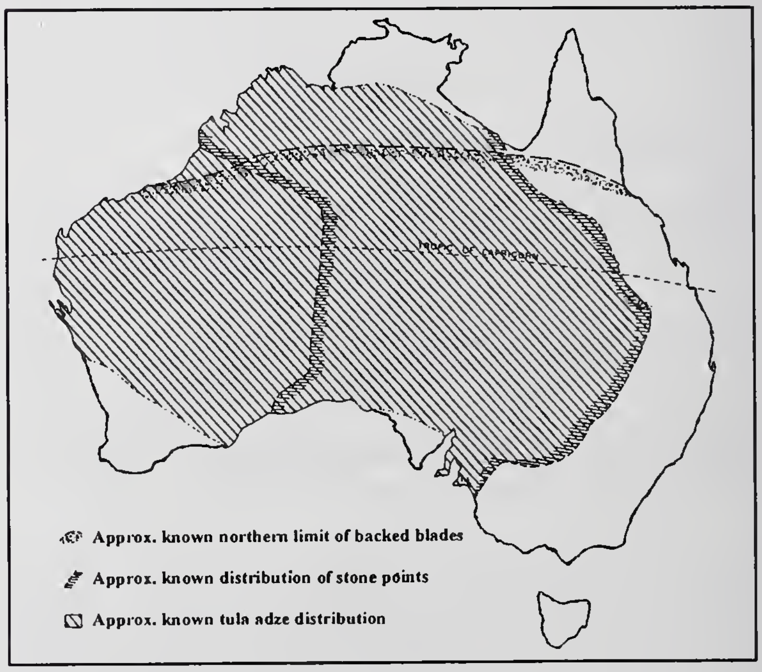

Fig. 4. Approximate distribution of selected artefact types in Australia (adapted from Flood 1983:187).

A RETURN TO SOUTH AFRICA

If we bring only these very basic Australian Aboriginal patterns across to South Africa, some interesting parallels become obvious. These can be summarised as follows:

a) Linguistic Diversity.

Although most San/Bushman languages are extinct today, we know that a great variety of languages existed in the past. This was clearly recognised from historical times. Moffat (1842), for example, commented on "The variety of languages spoken by the Bushmen, even when nothing but a range of hills, or a river intervenes between tribes ..." Similarly, Orpen (1877:85) quotes a man from Bethulie, about 110 km south-east of the Kalkfontein Dam on the Riet River in the Free State, as saying, "I can speak Bushman language well, but I cannot understand the Bushmen of Riet River; their language is 'too double' ". The late Ernst Westphal, a pioneer in Bushman language studies, described the differences as being "like English is to Chinese" (comment in a Southern Sotho class at the University of Cape Town, 1965). Major current researchers like Traill (*e.g.* 1995) have access only to the last remains of language diversity which must have parallelled the position among the Australian Aborigines (Fig. 5). This language diversity might well have been connected with a second feature noted among the Aborigines.

b) Territoriality

The Aborigines were clearly highly territorial, as already pointed out, but what of the position in South Africa? For some years now Sealy and others have been concerned with reconstructing prehistoric dietary patterns on the basis of isotope analysis. From her initial major contribution, Sealy (1986) cast doubt on the seasonal mobility hypothesis by showing that some groups in the south-western Cape did indeed spend their whole lives at the coast rather than moving seasonally between the coast and the Cape Fold Mountains as envisaged by Parkington. Subsequent work in the same area has continued to support Sealy's position. In a recent publication Sealy, *et al.* (2000:41) note with regard to three child skeletons that they "ate diets based on terrestrial foods, clearly separating them from coastal skeletons with similar dates.This finding supports earlier suggestions that, in this part of the Western Cape, hunter-gatherers from the Fold Mountain Belt were economically

Fig. 5. Some surviving San/Bushman languages (adapted from Mitchell 2002:126).

and hence socially distinct from those at the coast . . ." An equivalent study on diet and landscape use in the Eastern Cape has elicited comments such as the following: "The isotopic contrasts are clear indicators of economic differences between adjacent groups of hunter-gatherers and, we believe, *evidence for territorial boundaries in the past*" (Sealy & Pfeiffer 2000:654; my emphasis). Sealy and Pfeiffer (2000:654) go on to challenge the Kalahari-inspired approach directly where they observe, "... there is a pervasive underlying assumption among archaeologists that Later Stone Age hunter-gatherers lived in mobile bands, ranging over long distances, as in the Kalahari. Our results indicate that this expectation is not necessarily met, at least for some groups in the southern Cape".

In another perspective on territoriality, Deacon (1986) has shown in the Northern Cape that distinct territorially based dialectal groups may be identified in the ethnographic record even where there are no ecological or other barriers to interaction. In trying to account for this linguistic diversity, Deacon & Deacon (1999:132) have recently referred to the concept of 'topophilia' which is "the affective bond between a people and the landscape in which they live *that extends into a desire to stress the individuality of the group*" (my emphasis). They go on to point out that, "The power of the bond that developed between the San and their surroundings is obvious from remarks they made about the land they regarded as *their own*. ... he rich folklore surrounding features in the landscape underscores this" (again, my emphasis). Language diversity (and topophilia) must reflect a deeper great emphasis on territoriality in the past that has apparently been neglected in southern Africa but has been recognised in Australia. If such is the case, a challenge for South African archaeology becomes taking account of such territoriality in the past.

Moreover, with reference to the /Xam area studied by Bleek and Lloyd, Deacon (1986) notes that there was no seasonal mobility "although the informants were certainly aware of the seasonal availability of food". Is this further evidence of territoriality?

These above features cannot be explained within the Kalahari analogue paradigm - they are 'anomalies', one might say - yet they parallel patterns that seem to have existed among the Aborigines. This 'anomalous situation' is compounded if we consider a further point that is seemingly overlooked in southern Africa.

c) Continuity

It has been pointed out that there is no demonstrable continuity or link between the modern San and the LSA (Mithen 2004:568, note 14).This 'link' was disrupted by the arrival of mixed farmers and pastoralists about 2 000 years ago. This is something that is, of course, unparalleled in Australia. Yet this lack of continuity in southern Africa is manifest if we look closely at the evidence. We have no ethnographic accounts of San life in caves and rock shelters - a major focus of LSA research (Barham 1992:45). 'Open air'activities need not necessarily parallel 'cave/shelter' activities. This latter point is highlighted for the Kalahari by Drotsky's Cave. Excavations by Robbins in the mid-1990s revealed occupation from about 30 000 to around 4.4 to 4.1 thousand years ago (Mithen 2004:568, note 11). Yet when Yellen asked modern-day !Kung about the cave, they believed it had only ever been used as a place to collect honey; they had never camped in the cave itself (Mithen 2004:468). One might well ask why? Is/was there a different attitude to caves? If so, what are the implications of this for parts of South Africa, like the central interior, where caves are rare? Or, indeed, coastal areas where cave sites have been the focus of research and upon which Parkington's seasonal mobility model was based?

DISCUSSION

I would suggest that a major point that we have to accept is that 'Stone Age' people no longer exist in southern Africa - or Australia. If we acknowledge this, how do we address the Stone Age past? Two issues seem to arise:

As we have already seen, our lithic analyses seem to mask social patterns like territoriality even if we can detect time trends in artefact frequencies and dimensions. This was my experience in the Northern Cape in the 1970s. Since then, however, more sophisticated types of analysis have been developed. Among these are Wadley's (1987) work on gender relations, social obligations and aggregation/dispersal sites but these still mainly follow Kalahari ethnography. Mazel (1989) has adopted a historical materialist approach with an emphasis on 'people to people' rather than 'people to land'. Both of these researchers have (rightly or wrongly) come in for criticism by Barham (1992) who suggests we should "walk before we run". I would suggest that as a first step we should try to address territoriality which was clearly a fundamental factor in the past. Ouzman (1995:15, note 3) anticipated this in the following remark: "Territoriality is a function of all mammals and we can predict that it will be present at some

level in human communities". This enterprise can be advanced by more intensive isotope studies along the lines of the work of Sealy and others, referred to above, but extending into the central interior when this becomes feasible. We need, further, to complement this work by looking for 'trace elements'(for want of a better term) in assemblages. I have suggested bifacial tanged and barbed arrowheads as one example of a possible significant trace element with territorial and social implications (Humphreys 1984). Mitchell (2002:294-5) has elaborated on this idea, while Ouzman (1995), in the field of rock art, has referred to the representation of mormyrid fish as social network markers. The answers, if we are to find them, probably lie in the subtle detail, not the 'macro' which has tended to be emphasised in the traditional culture history model.

On the other hand, what are the implications of this territorial approach for both regions in terms of the 'history' of existing alleged 'Stone Age' people? As Mithen (2004: 358) has observed, "The Stone Age is politically potent, ready to be exploited by politicians for their own ends". A study by Saethre (2004) in the Northern Territories of Australia has shown that local Aborigines still insist on being regarded as 'hunter-gatherers', as a political statement against the establishment, even though such hunting and gathering (when it occurs) is now carried out with the aid of 4x4 vehicles and guns and bullets. Saethre, an enthusiastic walker, was regarded as 'eccentric' by the local Aborigines among whom he lived - why walk if you can drive?

In southern Africa, I believe (and this is by no means an original idea) that the Kalahari San represent recent readaptations to (or reconfigurations of) hunting and gathering from engagement with pastoral and farming lifestyles due to social and economic oppression and environmental change (*cf.* Mithen 2004:568, note 14). This is true of all surviving groups, not only the 'archaeologically favoured' !Kung, even if some of the more extreme claims of 'encapsulation' within extensive Iron Age political and economic hierarchies cannot fully be sustained (*cf.* Denbow 1990; Sadr 1997). Attempts to 'preserve' these (re-) adaptations lead to Kagga Kamma-like situations of 'staged ethnicity' (White 1993). While these are good, no doubt, for the tourist industry, they are irrelevant to the archaeological past. Similarly, much in the news at present is the Botswana Government's policy on what it calls 'Remote Area Dwellers' (RADs), including large numbers of San (or Basarwa to use the Botswana term), who are being 'forcibly removed' from the Central Kalahari Game Reserve. Is this policy the adoption of a realistic approach based on modern realities - or genocide as some suggest? (check 'Basarwa' on 'Google' for ongoing reporting.) As Mithen says, "The Stone Age is politically potent". But, either way in Botswana, is this relevant archaeologically when it comes to understanding the LSA?

CONCLUSION

It seems clear, even on the basis of this cursory discussion (and this is all that it aspires to be), that there is sufficient reason for us to "de-!Kung" the central interior, and, indeed, the whole of southern Africa as suggested, interestingly, by Parkington (1984) himself over 20 years ago. The suggested use of broad Australian Aboriginal analogues notwithstanding, I should like to conclude with some words from Mithen (2004:358): "Archaeologists must not be tempted by the present; they must keep returning to the analysis of artefacts and the pursuit of excavation. There are no short cuts to the prehistoric past". It is as well to heed this advice as we grapple with the LSA archaeological record.

ACKNOWLEDGMENTS

Thanks are due to two anonymous referees whose comments helped to sharpen some of the issues raised. I am, however, responsible for whatever limitations remain.

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Southern African Field Archaeology **13 & 14**:42-48. 2004/2005.

ARCHAEOLOGICAL MITIGATION FOR PROJECT LION

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ABSTRACT

Mitigation measures for a new mine development in the Steelpoort valley concentrated on an Early Iron Age Doornkop village and a Late Iron Age Icon furnace. The early village yielded the remains of cattle kraals, middens and storage pits, as well as a Zhizo series glass bead. Most of the furnace walls had disappeared, but the outline of the base still remained.

INTRODUCTION

Xstrata South Africa and Xstrata Alloys intend to develop a portion of the farm Spitskop 333KT adjacent to their Vantech Mine near Steelport. The Vantech complex includes a magnetite plant, and mine, while the new development (Project Lion) will include a smelter, slimes dam, power line and associated roads network.

Archaeological Resources Management (ARM) identified two archaeological sites worthy of mitigation during the Phase I survey (Huffman & Schoeman 2004). The two sites both dated to the Iron Age: Site 1 belonged to the Doornkop facies (AD 650-950) of the Early Iron Age and represented a large village; Site 10, on the other hand, marked an iron furnace dating to the Icon facies (AD 1300-1500) of the Late Iron Age.

An ARM team investigated both sites in October 2004. Later, ARM examined an area for historic graves (Huffman 2005) and then documented several features uncovered during mining developments. This report presents the results of both sessions. As a Phase II report, the results include a description of the excavations and features and a minimum analysis of the finds. This documentation will enable future research.

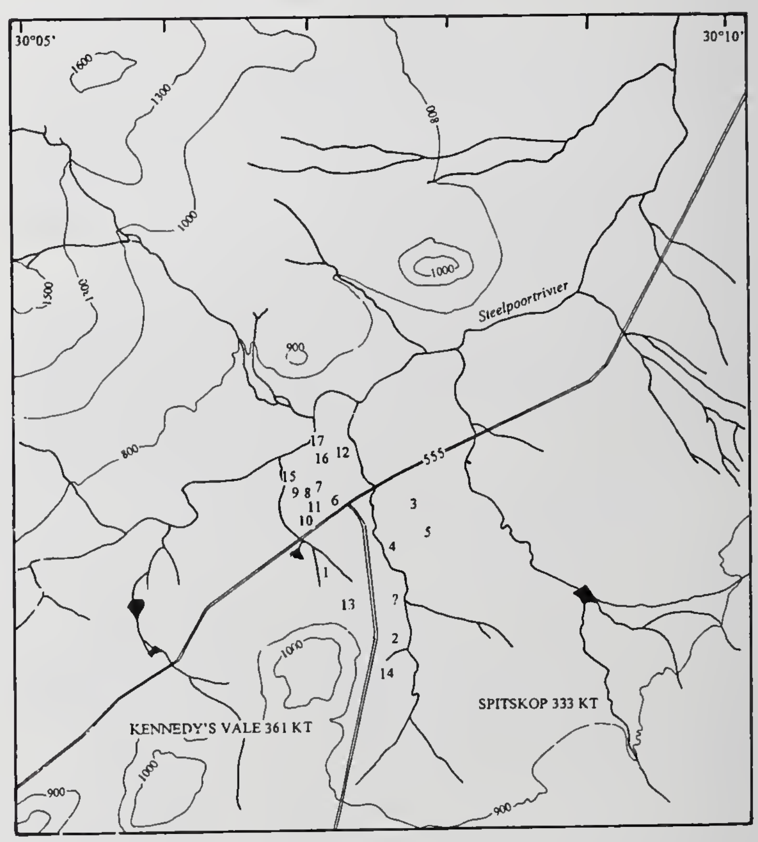

Fig. 1. Archaeological and historical sites recorded in the surveys.

SITE 1 (2430 CC 4) DOORNKOP

Site 1 lay at the base of an ironstone hill on the farm Spitskop 333 KT (Fig. 1). It covered about 900m^2 (24 49 13S 30 07 09E) between two small streams that flowed north into the Steelpoort River. Three trenches were excavated in this area (Fig. 2), and most deposit was sieved.

Excavations

Trench 1 was 2 x 8 m long, divided into 2 m squares (Fig. 3). It was placed over what appeared to be the collapsed remains of a raised daga feature exposed in a graded road. The soil was highly compacted. We abandoned this area after other trenches showed that the top 30 cm was completely disturbed.

One find was nevertheless noteworthy. A small (20 x 20 mm), heavily patinated blue glass bead was trapped in a daga patch in Square D, level 1. The bead belongs to the Zhizo series and dates to between AD 750 and 950 (M Wood, pers comm. 2005).

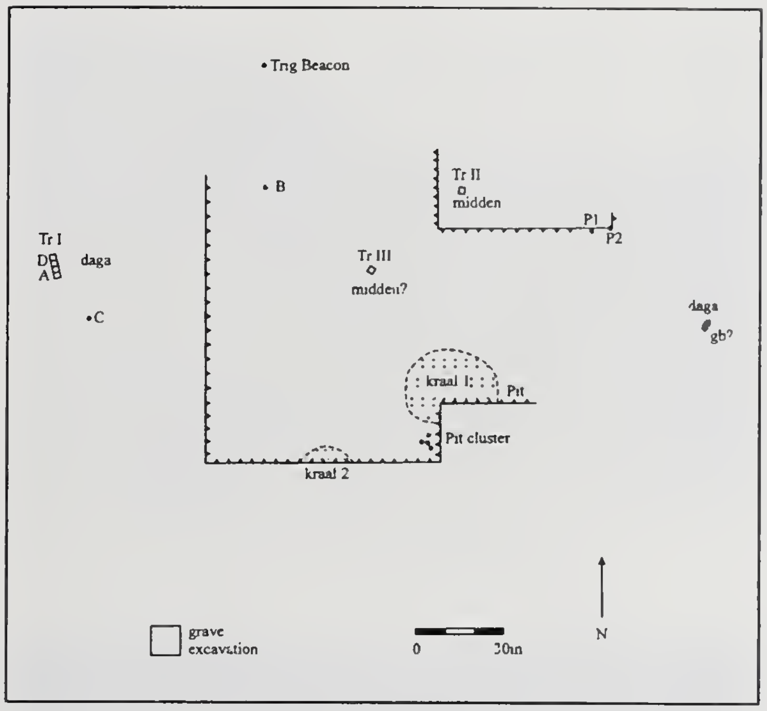

Fig. 2. Plan of Site 1 (2430 CC4).

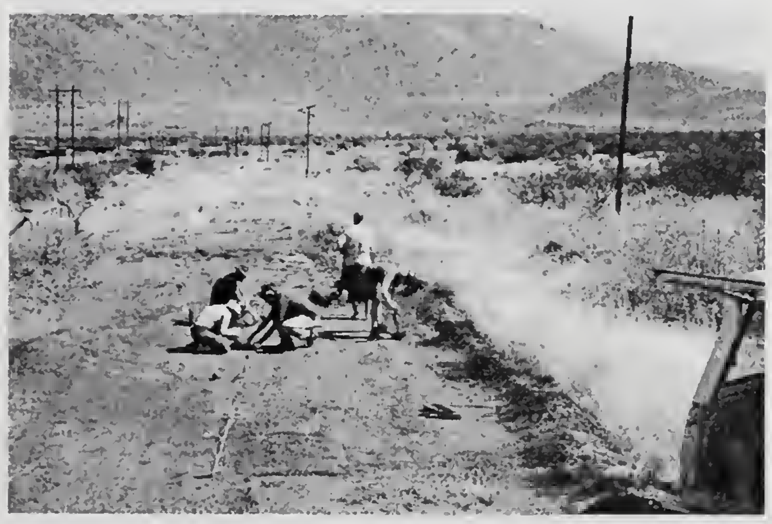

Fig. 3. Site 1: Trench 1, looking north.

Fig. 4. Site 1: Trench 1, looking south.

Trench II was a 2 x 2 m square placed over a high concentration of ceramics (Fig. 4). The team began the excavation in 10 cm levels. The top 30 cm (silty brown) had been completely disturbed through previous agricultural activities (Fig. 5A). Underneath the disturbed zone (levels 1-3) laid a grey ashy area that marked the remains of a midden (level 3 ash) traversed by an animal burrow (Fig. 5B). Mottled red soil below formed the substrate.

Trench II yielded a variety of artefacts in addition to ceramics, including daga lumps, bone points, shell beads (ostrich & fresh water mussel), a cow mandible, stone beads and metal items (Table 1).

Trench III was a 2 x 2 m square dug into another concentration a few metres away (Fig. 6). Here the stratigraphy comprised 22 to 24 cm of mottled brown soil created by agricultural activities that used a bulldozer: teeth

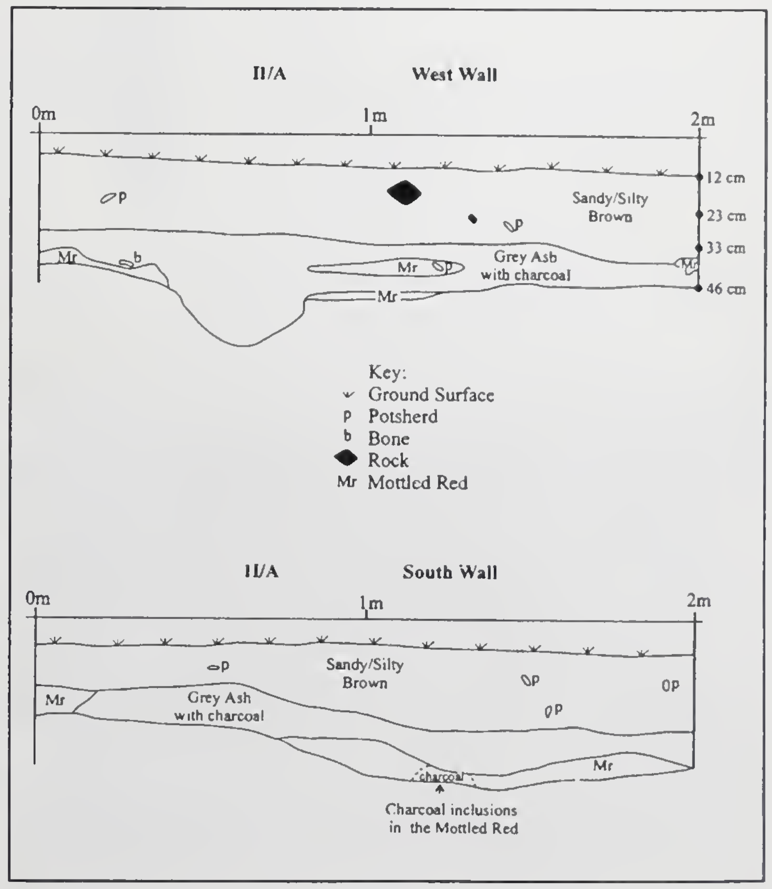

Fig. 5a. Site 1: cross section of Trench II.

Fig. 5a. Site 1: Trench II., grey ashy area marks the remains of a midden traversed by an animal burrow.

		pottery		clay	beads	bone	metal	Stone flakes	misc
	rims	dec	plain						
Level 1	35	132	660	3 daga 4 figs	18 oes 24 shell 1 stone	152	1 1 razor	2	
2	24	138	601	5 daga	12 oes 40 shell 1 stone	179 5 pts	2 beads 1 bangle	2	
3	6	40	245	1 daga	7 oes 16 shell	49 1 pt		2	
3 ash	13	68	286	16 daga 3 figs 1 ball	15 oes 17 shell	281			1 clay roll 1 cow mandible

marks were clearly visible at this depth. Underneath was a 1-5 cm layer of grey ash representing the remnants of the village deposit.

Grave Area

After the initial mitigation, various members of the local community identified grave sites in the general vicinity of Site 1. The Mine knew of a least one graveyard against the hillside, well away from t he impact zone, but another area, near Trench I, was not recognized previously. Consequently, the Mine fenced the area and commissioned ARM to search for historic graves.

ARM investigated the area on the 25th and 26th of April, 2005. A local company supplied six workers, and the Mine supplied a small earthmoving machine (Fig. 7). The team first removed the brown topsoil in a 2 x 5 m area inside the 11 x 11 m designated area. The front-end loader removed the remaining soil, and the team then shovelled away the loose debris.

The topsoil averaged 17 to 25 cm below the present surface. It lay directly on top of decomposing bedrock without any sign of the Early Iron Age village horizon. Furthermore, there was no evidence of historic graves.

Fig. 6. Site 1. Trench III.

Fig. 7. Site 1.: grave area.

Features

Fortunately, excavations for the new mine plant north of the grave area uncovered a number of features associated with the older village (Fig. 8). Two pits, about 6 m apart, were exposed in the side of a cutting (Fig. 9). Pit 1 was 50 - 60 cm wide; it extended to about 80 cm beneath the 30 cm black agricultural horizon. A large Doornkop jar (Fig. 10) sat upside down near the bottom, under a bowl. Cow skull fragments were in the bowl, while a large rib and another jar rim lay inside the large jar. Pit 2 was about 1 m wide, and about 60 cm extended beneath some 35 cm of disturbed soil (Fig. 11). About one half was excavated. A khaki coloured deposit at the bottom showed that the pit had been originally lined with cattle dung. It contained part of a cow maxilla, daga, a few large stones and Doornkop pottery (4 rims, 12 decorated and 61 plain).

Several other pits were associated with a cattle kraal about 40 m to the south. Kraal 1, marked by light coloured soil with white patches, contained one pit (filled with dung) near the eastern margin and a cluster of four more on the south side. Each contained typical Doornkop pottery (Fig.12); they were not excavated. Another light-coloured lenses, 15 to 25 cm thick, marked the location of a second kraal about 20 m away. Soil samples were collected for future analysis.

Preliminary Discussion

Dung-lined storage pits in or near a cattle kraal are a

Fig. 8. Site 1: plant area, looking southwest.

Fig. 9. Site 1: Pit 1 (right), Pit 2 left.

feature of the Central Cattle Pattern (Huffman 1982). Houses and grain bins would have surrounded this inner core. If the daga in Trench I lay near its original location, then it was probably part of the outer residential zone. The midden in Trench II also probably formed at the back of the homestead, near the grain bins. Although investigations were limited, the homestead marked by kraals 1 and 2 appears to have been particularly large.

Although the excavations did not yield carbonised grains, the type of grindstones on site show that the villagers cultivated sorghums and millets. Indeed, the settlement was probably positioned to take advantage of the cultivatable alluvial and colluvial soils derived from the surrounding hills.

Fig. 10. Jar from Pit 1.

Fig. 11. Site 1: Pit 2.

Finally, the glass bead must surely be associated with the Early Iron Age village even though the top 30 cm of deposit had been disturbed. Except for an historic Pedi homestead near the stream on the eastern margin of the site, only Doornkop pottery is present, and the bead series dates to the same period. The bead itself was probably an import from Southeast Asia (Wood 2005).

SITE 10 (2430 CC 13) ICON

Several sites north of the R555 contained Icon pottery. Slag, tuyeres and other furnace debris lay exposed in Site 10 (24. 48.46 S; 30.06.59.3 E). The ARM team placed three 2 x 2 m squares over the concentration, and excavated

Fig. 12. Site 1: *Doornkop* pottery from pit cluster next kraal 1.

Fig. 13. Site 10, looking northwest.

Fig. 14. Site 10: *Icon* pottery from furnace area.

Square A, half of A2 and C (Fig. 13). The concentration formed one level of red brown soil, varying from 8 to 14 cm below the surface. Mottled red soil with small calcium nodules formed the substrate. All material was sieved. Finds included Icon pottery (Fig. 14), slag, tuyeres ore and furnace debris (Table 2).

In addition to the debris, all that remained of the furnace was an oval about 75 cm long, orientated east/west, with a 30 cm extension to the east (Fig.15). The bottom sat at about 25 cm below the present surface, and the shallow depression contained highly vitrified slag. Samples were retained for future analysis.

Preliminary Discussion

This furnace was most probably associated with the Icon homesteads in the near vicinity. It was common practice in the past to smelt metals outside the settlement, and Site 10 conforms to this pattern.

This is the first recorded furnace dating to the Icon period, and so the excavation was important. Unfortunately, little remained to reconstruct the furnace. Presumably, an outer wall about 50 cm high helped to form an oven where a reducing atmosphere could be created in temperatures up to 1500^{0} C (see Miller 2002).

Table 2. Artefacts from Site 10.

		pottery			Smelting debris		Stone flakes	other
	rims	dec	plain	daga	slag	tuyeres		
Level 1A	2	1	37	8	621	3		1 Cu bangle
1A2	1		13	3	468			4 ore
1C		5	50		103	1	2	5 ore

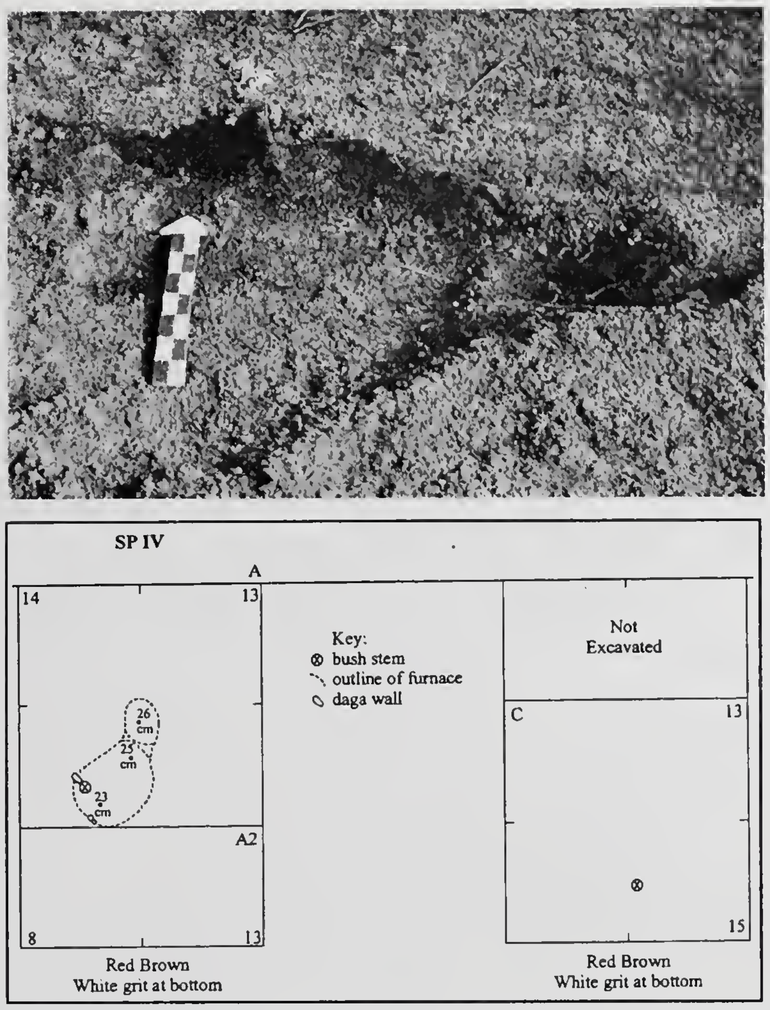

Fig. 15. Site 10: Furnace photograph and plan.

DISCUSSION

The surveys for Project Lion established the local culture history sequence that formed the background to the mitigation. First was the Mzonjani pottery (Maggs 1980) at Site 16 (found during the mitigation phase), dating to between AD 450 and 700. Mzonjani is the second phase, derived from Silver Leaves (Klapwijk & Huffman 1996), of the Kwale Branch of the UREWE TRADITION. Mzonjani merged with Happy Rest (Prinsloo 1974), the earliest phase of the KALUNDU TRADITION in southern Africa, to produce Doornkop (Inskeep & Maggs 1975; Whitelaw 1996). This merger took place somewhere further north in Limpopo Province. Doornkop (Inskeep & Maggs 1975; Whitelaw 1996) in turn generated K2 (Fouche 1937), found in the Limpopo Valley, and Klingbiel (Evers 1980), found on Site 15.

K2 — *Klingbiel*   *Eiland* → *Icon*

↑   ↑

Doornkop   *Diamant*

↑

Happy Rest ← *Mzonjani*

↑

Silver Leaves

KALUNDU TRADITION   **UREWE TRADITION**

Later, at about AD 1300 ± 50, the first Sotho/Tswana-speaking people, making Icon (Hanisch 1977) pottery (a late phase in the UREWE TRADITION), moved into southern Africa. As pottery from Sites 7 to 11 show, they too interacted with earlier people in the Limpopo Province, this time making Eiland (Evers 1981) pottery (the third phase of another branch of Happy Rest).

The mitigation exercise concentrated on Doornkop and Icon sites. Some finds help to expand our knowledge of life ways in the Early Iron Age. For instance, the glass bead from Trench I is the first recorded from any Doornkop site. The same kind of imported bead was common at this time in the Limpopo Valley where local people were involved in an extensive East Coast ivory trade (Wood 2000). Besides ivory, the trade also included iron. Significantly, a few other places near iron ore deposits have yielded the same early bead, notably the Tswapong Hills in Botswana and the western edge of the Waterberg. The Doornkop people at Site 1 therefore may well have been part of an iron-trading network connected in some way to the East Coast.

The other finds of interest are the cattle teeth from Pit 2 and the ash layer in Trench II. Cattle remains are typical of Early Iron Age sites, but their numbers are usually low, as at Site 1. The two kraals in the new plant area, however, show that the faunal remains seriously under represent the actual numbers present in the settlement. It is therefore not possible to estimate the importance of cattle from faunal remains alone. According to ethnographic and other evidence (Huffman 1982), the presence of the Central Cattle Pattern shows that Doornkop villagers practiced lobola, that is to say, they exchanged cattle for wives.

The material saved for future analyses should contribute to a better understanding of other aspects of life in the Early Iron Age. The remains from Site 10, furthermore, should help elucidate iron production at the beginning of the Late Iron Age.

ACKNOWLEDGEMENTS

We thank Mr F Cotton, Xstrata Alloys, for organizing various aspects of the survey and mitigation. We also thank M Wood for identifying the glass bead. The ARM team included Laura Barrie, Kate James. Sello Mokhanya, Juergen Lier, Princess Sekgarametso, & Wayne Glenny. Excavations were conducted under SAHRA permit No. 80/04/09/014/51.

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Southern African Field Archaeology **13 & 14**:49-77. 2004/2005.

ARCHAEOLOGICAL RESEARCH ALONG THE SOUTH-EASTERN CAPE COAST PART I: OPEN-AIR SHELL MIDDENS

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ABSTRACT

This paper reports the findings of the research conducted on Holocene Later Stone Age open-air shell middens along the Cape St Francis coast. To study the shell middens systematically, the research area was divided into eight zones and the coast into five ecological habitats. Two distinct shellfish collecting strategies were noted among the different groups that utilised this resource. Hunter-gatherers and pastoralists collected mainly the larger shellfish species which are only available during certain tidal periods. 'Ceramic' groups on the other hand seemed to be more dependent on shellfish and collected large quantities of small species irrespective of the tidal periods. The distance shellfish that had to be carried between the coast and campsites also played an important role in the species collected.

INTRODUCTION

The background to the research project along the Cape St Francis coast has been published and should be consulted for the descriptions, definitions and terminology used in this paper (see Binneman 2001).

Sampling was conducted at eight locations along the Cape St Francis coast and adjacent dune system, and at one location at the mouth of the Kabeljous River (Figs 1a, b & c). These locations were chosen due to their richness and variety in archaeological features and their specific ecological habitats.

In general, single open-air shell middens carry little information. This is especially true of food waste other than shellfish and of cultural material. Because small volumes of material were taken from the majority of the shell middens, they yielded very little apart from shellfish remains. Thus other food waste and cultural material will not be discussed in detail but only tabulated. Only the important aspects of the research for each zone will be discussed.

The investigation into the different shellfish collecting patterns followed by the different groups is based on the 'economic return ratio' (ERR) for each species. The approach and descriptions regarding the different groups and types of shell middens have been outlined elsewhere (see Binneman 1996, 2001:82-83). As an aid to the discussion of shellfish remains, I report relative frequency percentage without brackets and meat mass in grams frequency percentage within block brackets.

In this paper, references are also made to the Kabeljous Industry but are not discussed here in detail (quartzite stone tool assemblages named after the Kabeljous River Shelters some 4 km upstream from the mouth of a river with the same name). The industry will be discussed at a later stage when information on the shelter is published (for information see Binneman 1996).

RESEARCH AND DESCRIPTIONS WITHIN THE ZONES

KABELJOUS RIVER MOUTH

Four shell middens were sampled along the western side of the Kabeljous River Mouth (Fig.1d). They were all severely damaged in building operations (Binneman 2001, fig. 23). These middens were sampled to compare shell remains, other faunal remains and cultural material to those from the Kabeljous Shelters nearby.

Two middens were of pastoralist/'ceramic' type and yielded pottery and sheep remains, and one was occupied by hunter-collector-fishers and yielded a Kabeljous Industry, including large segments and bored stones. The shell middens were situated a few hundred metres from the estuary opposite a sandy beach with the nearest rocky shore some 1,5 km away. These sites were all built over.

<u>KR/SM1A & B</u>

KR/SM1A was a large windblown area previously levelled by earth moving vehicles. The area was littered with pottery, stone tools, other cultural material, and food

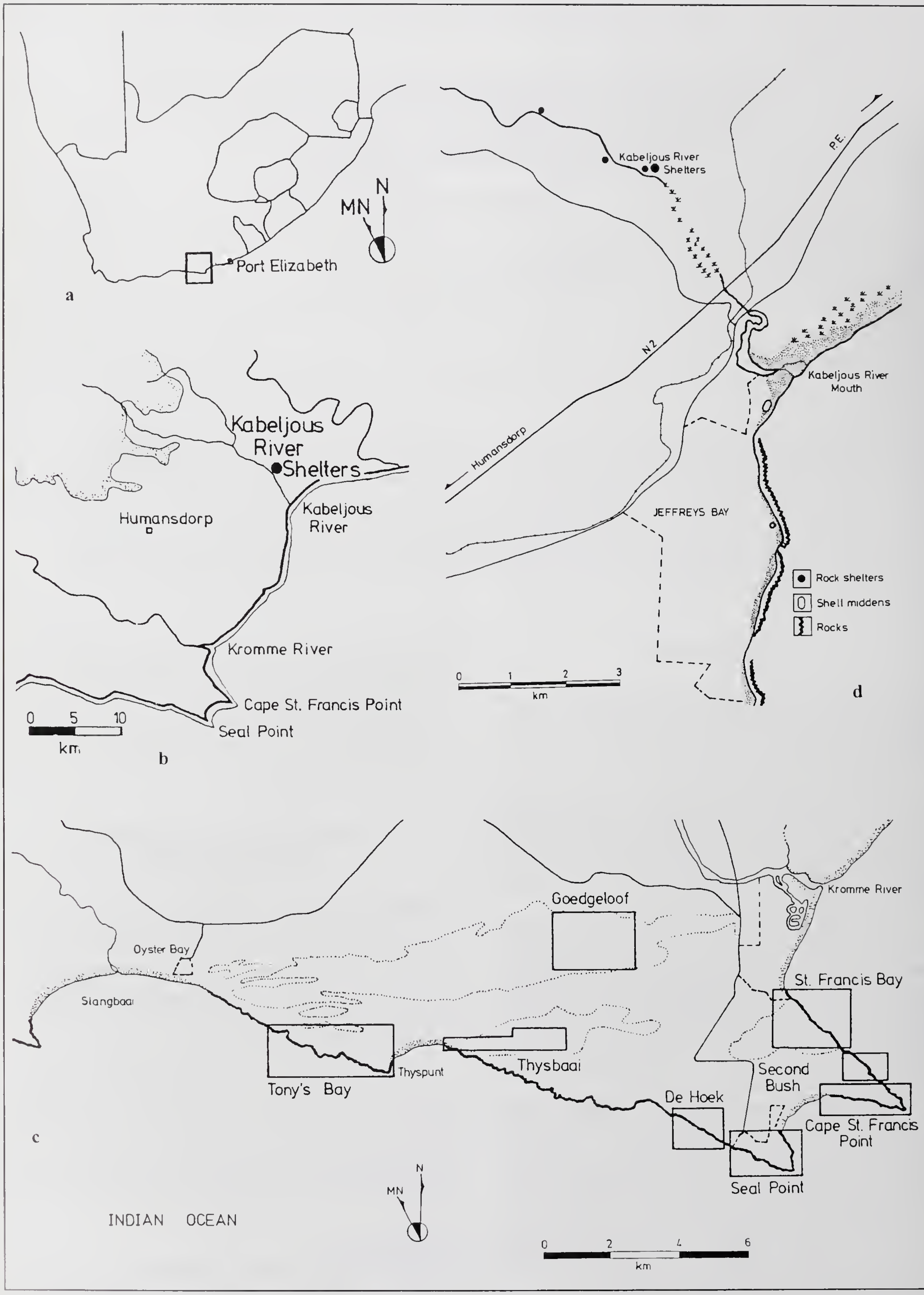

Fig. 1. Map of the different locations sampled along the Cape St Francis coast.

Table 1. Preliminary count of faunal species from the Kabeljous River Mouth and St Francis Bay area 1 middens.

	Kabeljous River Mouth			St Francis Bay midden 1/1					
	KR/SM1A*	KR/SM1B*	2C AREA	L1+	L2+	L3+	L4+	4SS+	TOTAL
MAMMALS									
Arctocephalus pusillus	1	1	1		1	1	5	1	8
Equus sp.		1	1						
Hippopotamus amphibius	1								
Alcelaphus buselapus			1						
Silvicapra grammia	1								
Lepus sp.	1								
Hystrix africae-australis		1							
Ovis aries									
juvenile	3	1							
sub-adult	1	1							
adult		1							
old	2								
Bovidae - general									
small medium				1					1
large medium	1	1		1					1
large			1						
TOTAL	**11**	**7**	**4**	**2**	**1**	**1**	**5**	**1**	**10**

* Pottery and sheep present
+ Only pottery present

Table 2. List of radiocarbon dates for open-air shell middens from the south-eastern Cape coast (Cape St Francis area).

SITE	DATE BP	ASSOCIATION
COASTAL SITES		
Kabeljous River Mouth 2B	2570 ± 60 (Pta-3907)	Kabeljous
Kabeljous River Mouth 1A	1560 ± 40 (Pta-5982)	Pastoralists
St Francis Bay	5180 ± 65 (Pta-1089)	Wilton (De Villiers 1974)
St Francis Bay 2/2	4250 ± 70 (Pta-5042)	Wilton
St Francis Bay 10B	3640 ± 60 (Pta-5055)	Wilton
St Francis Bay 2/1C	1900 ± 50 (Pta-3910)	Wilton
St Francis Bay 2/4	4160 ± 60 (Pta-7550)	Kabeljous
St Francis Bay 1/1	1770 ± 50 (Pta-9311)	Ceramics
Goedgeloof C1/M1	2890 ± 40 (Pta-4066)	Kabeljous
Goedgeloof C3/M4	1270 ± 50 (Pta-4616)	Pastoralists
Goedgeloof C2	245 ± 20 (Pta-8696)	Ceramics/slag (cal. AD 1666)
De Hoek SS6	250 ± 50 (Pta-3908)	Ceramics
Thysbaai W2	3760 ± 60 (Pta-5050)	Wilton
Thysbaai W1	1720 ± 50 (Pta-8653)	Wilton
Oyster Bay HS1/S2	190 ± 50 (Pta-6998)	pastoralists

waste and was one of only a few Khoi pastoralist sites in the research area. A surface sample of faunal remains yielded remains of six sheep (Table 1). Sheep remains identified by J. Brink have been dated to 1560 ± 40 BP (Pta-5982) (Table 2). A surface sample to establish the shellfish content at the site was also collected (Table 3). *Perna perna*, 49,3% [33,7%] was the dominant shellfish species. *Oxystele* spp., 19,2% [4,2%] and *Donax serra*, were also present in fair numbers with *Turbo sarmaticus*, 6,5% [16,6%] the only other significant species. Although *Oxystele* spp. presented a high percentage frequency, its contribution in meat mass was insignificant in comparison with *D. serra* and *T. sarmaticus*. The economic return ratio (ERR) was 33,3% (also see Binneman 2001, table 1). A

Table 3. Shellfish: frequency percentage per species and percentage meat mass contribution from the Kabeljous River Mouth middens.

	KR/SM1A*				KR/SM1B*				KR/SM2A#				KR/SM2B#			
	f	f %	mm/gr	mm %	f	f%	mm/gr	mm%	f	f%	mm/gr	mm%	f	f%	mm/gr	mm%
Perna perna	129	49,3	447,3	33,7	696	16,3	3062,4	20,0	2741	55,0	13430,9	49,5	1082	57,2	4760,0	33,5
Donax serra	48	18,4	643,2	45,5	633	14,8	7026,3	45,9	906	18,2	11778,0	43,4	551	29,1	8650,7	60,9
Patalla barbara					4	0,1			26	0,5			3	0,2		
Patella cochlear									72	1,4			5	0,3		
Patella longicosta	6	2,3			35	0,8			61	1,2			10	0,5		
Patella oculus					3	0,1			10	0,2						
Patella tabularis									7	0,1			5	0,3		
Haliotis midae									3	0,1			3	0,2		
Haliotis spadicea					2	0,1			15	0,3			6	0,3		
Oxystele spp.	50	19,2	60,0	4,2	2498	58,4	2747,8	18,0	799	16,0			126	6,7		
Turbo sarmaticus	17	6,5	234,6	16,6	352	8,2	2464,0	16,1	192	3,9	1920,0	7,1	80	4,2	800,0	5,6
Burnupena spp.	2	0,8			36	0,9			86	1,7			6	0,3		
Solen capensis	4	1,6							3	0,1						
Dinoplax gigas	5	1,9			15	0,4			64	1,3			11	0,6		
TOTAL	261	100,0	1415,1	100,0	4274	100,1	15300,5	100,0	4985	100,0	27128,9	100,0	1888	99,9	14210,7	100,0

	KR/SM1A*	KR/SM1B*	KR/SM2A#	KR/SM2B#
Buckets sampled	3=	13	15	8
Buckets analysed	1=	13	15	8
Meat mass/volume	1415,1	1177,0	1808,6	1776,3
Total collecting mass	4245,9	60070,0	71989,7	35923,6
% meat mass of total mass/volume	**33,3**	**25,5**	**37,7**	**39,6**

= Surface samples
* Pottery and sheep
# Kabeljous Industry

Only those shellfish species which contributed relatively high meat mass are considered.

small collection of cultural material was also made (Tables 4 & 5).

A small damaged shell midden, KR/SM1B, located in the same area was also sampled. One square metre was excavated to establish the percentages of shellfish species. The deposit was only 0,1 m thick and contained pottery and the remains of three sheep (Table 1). This midden is not considered to be of pastoralist origin because the shellfish content was similar to that of 'ceramic' middens sampled elsewhere along the Cape St Francis coast (see below). *Oxystele* spp. represented 58,4% [18,0%], while *Perna perna*, 16,3% [20,0%] and *Donax serra*, 14,8% [45,9%] were the only other species of significance (Table 2). Little cultural material was recovered (Tables 4 & 5). As in the case of KR/SM1A, *Oxystele* spp. was well represented but the contribution in meat mass was low. The ERR of 25,5% was notably lower than that of the pastoralist midden.

<u>KR/SM2A & 2B</u>

A second area, some 200 m west of KR/SM1B, was also investigated. Several middens had been badly damaged by building operations or crushed by earth moving vehicles. The area was sampled for important archaeological material. Several large segments and bored stones were recovered (Table 4).

Shell midden KR/SM2 was 0,20 m thick and consisted of two shell lenses separated by a lens of sterile white sand. *P. perna* was the dominant shellfish species in both layers (Table 3). Layer 2A consisted of 55,0% [49,5%] *P. perna*, 18,2% [43,4%] *D. serra* and only 16,0% [3%] *Oxystele* spp., and layer 2B of 57,2% [33,5%] *P. perna*, 29,1% [60,9%] *D. serra* and only 6,7% [1%] *Oxystele* spp. Both layers yielded abundant fish remains. The ERR for KR/SM2A was 37,7% and 39,6% for KR/SM2B.

A large quartzite segment was also found in layer 2B. This layer has been dated to 2570 $\pm$ 60 BP (Pta-3907). Five large quartzite segments, two bored stones and *D. serra* scrapers and pendants were also found near the midden (2C area) (Tables 4 & 5).

Discussion

Although both KR/SM1A & 1B yielded sheep remains and pottery, the latter is not regarded as a true pastoralist site, but rather as been occupied by a 'ceramic' group. The high frequency of Oxystele spp. present in the site as well as the notably lower meat mass per volume and ERR, provide the reason for this conclusion. The sheep remains present in the site may have been acquired from pastoralists.

The HCF middens (KR/SM2A & B) and pastoralist midden (KR/SM1A) displayed a similar pattern to those observed from other similar middens elsewhere in the research area (high frequencies of *P. perna* and *D. serra* and low f frequencies of *Oxystele* spp.). The 'ceramic'

Table 4. Cultural material: frequencies of stone artefacts from Kabeljous River Mouth, SFB1, SFB2 areas and the Dune Field area middens.

	Kabeljous River Mouth				SFB1/1						SFB2					Dune Field area				
	1A	1B	2A	2B	L1	L2	L3	L4	L4SS	L5	L1	L2	L3	2/2	2/5	4	6	8	10A	10B
WASTE																				
Chips	9							2						13*					1	1*
Chunks	8													33*						8*
Small cores													3*	16*						5*
Cobble cores	1		1	1							1			1*					3	1
CRP													4	12*						2*
Flakes	92		14	4	14	7	2	6	3	1	14	5	5*	383*	14	10	5	15	10	46*
TOTAL	**111**		**15**	**5**	**14**	**7**	**2**	**8**	**3**	**1**	**15**	**5**	**12**	**458**	**14**	**10**	**5**	**15**	**14**	**63**
UTILISED																				
Hammerstones												2	1						1	
Milled edge														1						
Grindstones																				
Hammer/grind																				
Flakes	3	3					1										2			6*
TOTAL	**3**	**3**					**1**					**2**	**1**	**1**			**2**		**1**	**6**
FORMAL																				
Scrapers													1*	67*						4*
Adzes														1*						1*
Borers														2*						1*
Large segments				1																
Backed flakes														2*						
Bored stones																				
Stone pipes														1*						
Misc retouched														5*						1*
TOTAL				**1**									**1**	**78**						**7**
OTHER																				
ochre	1	1	11	3			1				2	2		14						
Shale			1	1																

All quartzite unless indicated differently.

*Silcrete

midden on the other hand, displayed an interesting difference in the frequencies of shellfish collected. *Oxystele* spp. accounted for the bulk of shellfish with *P. perna* and *D. serra* present in low frequencies. *Oxystele* spp. are usually abundant in the upper balanoid zone and are also easy to collect during all tide cycles, but also provide little in return. It would appear that 'ceramic' shellfish collectors were not selective in their collecting strategy, but collected any species they encountered. The HCF on the other hand were more selective in the shellfish species they collected.

The different shellfish collecting strategies between the groups are clearly illustrated by the ERR's. The ERR for the 'ceramic' midden, KR/SM1B (25,5%), is notably lower than that for the pastoralist midden, KR/SM1A (33,3%) and HCF middens, KR/SM2A (37,7%) and KR/SM2B (39,6%). This pattern is also noticeable in the meat mass per volume; 1170,0 gram for the 'ceramic' midden (KR/SM1B) which is between 8% and 14% lower than that of the pastoralist midden (1415,1 gram) and the HCF middens (1873,0 gram and 1776,3 gram respectively).

ST FRANCIS BAY AND THE SURROUNDING DUNE FIELD AREA

The largest concentration of shell middens and other archaeological features occurred along the coast between St Francis Bay and Oyster Bay and in the shifting dune bypass system between the two coastal resorts (Binneman 2001, fig. 16).

SANTAREME BAY (SFB1/1)

SFB1/1 and five other middens were situated on vacant plots in Santareme Bay, an extension of St Francis Bay (Fig. 3). The midden was located on top of a densely vegetated three metre high dune, opposite a rocky coast. The sandy beach and rocky coast were only a few hundred metres away. *P. perna* is the dominant shellfish species along this part of the Cape St Francis coast.

The midden was 1,10 m thick. Six occupation layers were excavated yielding pottery in five layers (Fig. 4). No sheep remains were recovered from this midden (Table 1). Layer four, a stone feature which must have been a fire place, has been dated to 1770 ± 50 BP (Pta-9311) and

Table 5. Cultural remains: Frequencies of worked shell, bone and pottery from Kabeljous River Mouth, SFB1 and SFB2 middens.

	Kabeljous River Mouth				SFB1/1					SFB2/1			SFB2/2
	1A	1B	2A	2B	L1	L2	L3	L4	4SS	L1	L2	L3	L1
MARINE SHELL													
Nassarius kraussianus													
Shell		1		1					1	1		2	
Donax serra													
Pendants	1	4	11	10								1	14
Scrapers			13	13									
Bullia digitalis													
Beads										4	2		
Thais sp.													
Beads											2	1	
Conus sp.													
Beads	1												
Glycymeris sp.													
Beads										1	1		
Patella cochlear													
Pendant											1		
Burnupena sp.													
Beads												2	
Fusitriton sp.													
Beads												1	
Polynices sp.													
Beads												1	
TOTAL	**2**	**5**	**24**	**24**					**1**	**6**	**6**	**8**	**14**
OSTRICH EGGSHELL													
Beads	10	1			2	6	7		3	1		7	
TOTAL	**10**	**1**			**2**	**6**	**7**		**3**	**1**		**7**	
BONE													
Points										1			
Tubes	1												
Cut marks							1						
Utilised					1								
TOTAL	**1**				**1**		**1**			**1**			
POTTERY													
Fragments	130	15			18	6	1	2	9	288	71		
Rim	3									3			
Rim decorated										1			
Body Decorated	1	1											
Spouts										1			
Lugs										1			
TOTAL	**134**	**16**			**18**	**6**	**1**	**2**	**9**	**294**	**71**		

represents the oldest date for pottery found along the south-eastern Cape coast. Few cultural remains were recovered from the excavation (Tables 4 & 5).

P. perna was the dominant shellfish species in all the pottery layers and comprised between 75% [84%] and 91% [96%]. *Oxystele* spp., between 6% [2%] and 14% [4%], were the only other species present in notable frequencies. Other species were insignificant (Table 6). The ERR's were; Layer 1, 34,6%; Layer 2, 32,8%; Layer 3, 37,6%; Layer 4, 36,0% and Layer 4SS, 35,8%. Layer five was a thin shell lens 0,20 m below the stone feature. No pottery was present in this lens which probably represents HCF occupation. The shellfish content was markedly different from the overlying pottery layers (Table 5). *P. perna* (50,2% [47,9%]) comprised the largest percentage of the species and *Patella* spp. (25% [14%]) accounted for the bulk of the remainder. Notwithstanding, the total meat mass contribution was much lower than several other species. For example, *T. sarmaticus* (6% [28,3%] and *Haliotis spadicea* (6,3% [23,8%]) made a substantial higher contribution. The ERR was 45,5% which is notably higher than the pottery layers.

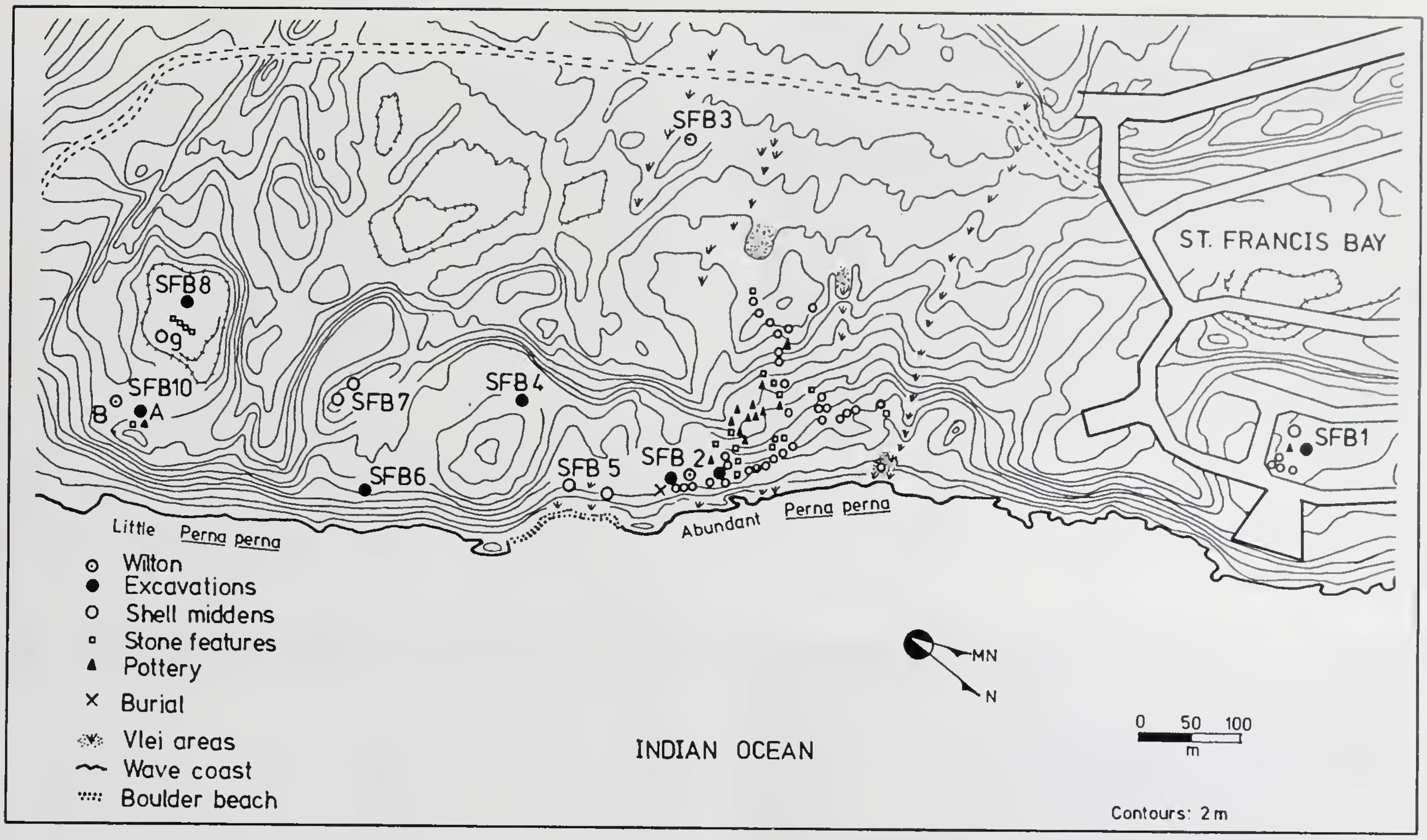

Fig. 2. Map of archaeological sites and features at St Francis Bay and Dune Field Areas as recorded during 1982.

Fig. 3. Location of SFB1/1.

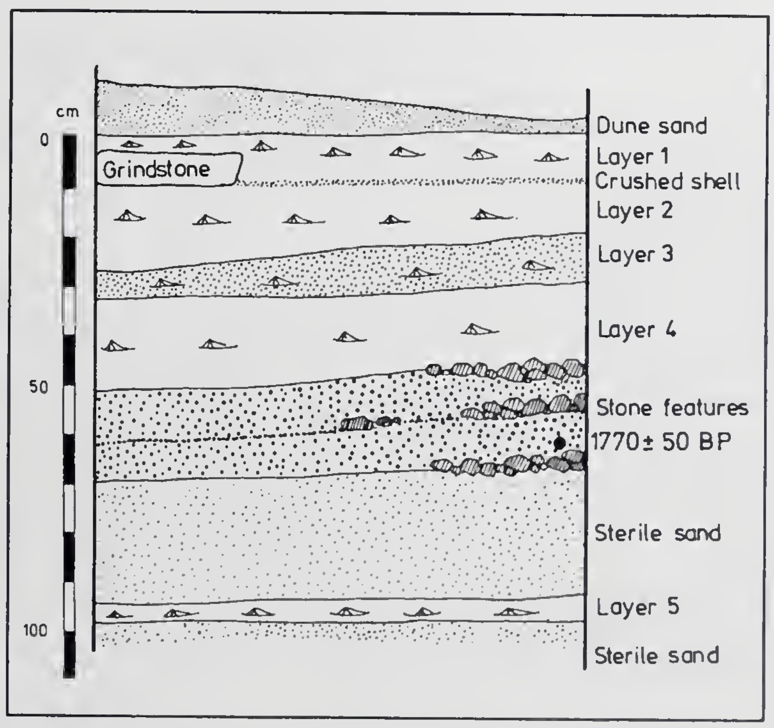

Fig. 4. Section drawing of the excavation at shell midden SFB1/1.

The presence of *H. spadicea* in layer 5 indicates that the lower balaniod zone had been more extensively exploited than the overlying pottery layers. This illustrates the different collecting strategies between HCF and 'ceramic' groups. The latter did not collect from the lower balaniod zone while HCF collected from both the upper and lower balaniod zones. In doing so they obtained species with relatively high meat mass, such as *T. sarmaticus* and *H. spadicea.*

SFB2 AREA

SFB2 was a large windblown dune area to the south of Santareme Bay (Fig. 2). This area comprised one of the largest concentrations of Holocene features in the research area. Several excavations and sampling of middens and other features were conducted opposite a wave coast adjacent to a small boulder coast. Extensive *P. perna* beds are present along this part of the coast.

During 1984, the entire area was covered with branches to stabilise the loose dune sand and it has since been developed into an exclusive holiday resort. The area covered approximately 40 000 square metres and 35 shell

Table 6. Shellfish frequency percentage per species and percentage meat mass contribution from midden SFB1/1.

	Layer 1*				Layer 2*				Layer 3*				Layer 4*			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	4048	86,6	24288,0	97,0	3845	75,5	21532,1	88,7	4295	81,8	24911,2	95,1	8352	91,2	42595,2	96,1
Donax serra	3	0,1							9	0,2			13	0,1		
Patella argenvillei	19	0,4			6	0,1			6	0,1			5	0,1		
Patalla barbara									3	0,1						
Patella cochlear	12	0,3			44	0,9			48	0,9			44	0,5		
Patella longicosta	7	0,2			34	0,7			20	0,4			10	0,1		
Patella miniata					4	0,1										
Patella oculus	14	0,3			52	1,0			31	0,6			25	0,3		
Patella tabularis	8	0,2			26	0,5	520,3	2,1	5	0,1			5	0,1		
Haliotis spadicea	3	0,1			23	0,5			16	0,2			13	0,2		
Oxystele spp.	384	8,2	422,4	1,7	723	14,2	939,9	3,9	619	11,8	804,7	3,1	519	5,7	674,7	1,5
Turbo sarmaticus	102	2,2	326,0	1,3	161	3,2	1288,2	5,3	80	1,5	480,0	1,8	73	0,8	1058,5	2,4
Burnupena spp.	44	0,9			148	2,9			81	1,5			74	0,8		
Solen capensis	22	0,5							28	0,5			12	0,1		
Dinoplax gigas	8	0,2			30	0,6			11	0,2			12	0,1		
TOTAL	4674	100,2	25036,4	100,0	5096	100,2	24280,5	100,0	5252	100,0	26195,9	100,0	9157	100,1	44328,4	100,0

	Layer 1*	Layer 2*	Layer 3*	Layer 4*
Buckets sampled	17	11	9	14
Buckets analysed	17	11	9	14
Meat mass/volume	1472,7	2207,3	2910,7	3116,3
Total collecting mass	72377,6	73938,0	9586,0	123238,2
% meat mass of total mass/volume	**34,7**	**32,8**	**37,6**	**36,0**

	Layer 4SS*								Layer 5#			
	f	f %	mm/gr	mm %	TOTAL f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	726	86,2	4573,8	93,6	21266	85,0	117900,3	94,5	166	50,2	962,8	47,9
Donax serra					25	0,10						
Patella argenvillei					36	0,20			10	3,0		
Patalla barbara					6	0,02			3	1,0		
Patella cochlear	7	0,8			197	0,80			42	12,7		
Patella longicosta					90	0,40			19	5,7		
Patella miniata					7	0,03			3	1,0		
Patella oculus					130	0,50			8	2,4		
Patella tabularis	2	0,2			47	0,20	520,3	0,4	1	0,3		
Haliotis spadicea	1	0,1			56	0,20			21	6,3	478,8	23,8
Oxystele spp.	56	6,6	72,8	1,5	2334	9,30	2914,5	2,3	33	10,0		
Turbo sarmaticus	23	2,7	241,5	5,0	459	1,80	3394,2	2,7	20	6,0	570,0	28,3
Burnupena spp.	25	3,0			376	1,50			4	1,4		
Solen capensis	2	0,2			64	0,30						
Dinoplax gigas	1	0,1			63	0,25			1	0,3		
TOTAL	843	99,9	4888,1	100,1	25012	100,70	124729,3	99,9	331	100,1	2011,6	100,0

	Layer 4SS*	Layer 5#
Buckets sampled	6	4
Buckets analysed	6	4
Meat mass/volume	814,7	502,8
Total collecting mass	13644,2	4425,1
% meat mass of total mass/volume	**35,8**	**45,5**

* Pottery

\# Kabeljous Industry

Only those shellfish species which contributed relatively high meat mass are considered.

middens and more than 20 stone features were recorded (Figs 5a & b). Only a few were still *in situ*. Most of these stone features were circular and consisted of heat fractured quartzite cobbles and pebbles. Large quantities of charcoal but little shell were associated with these features. Occasionally cores and flakes were also present. Three of these stone features in the SFB2 area were mapped (Binneman 2001, fig. 20). Two were fire places, probably hotplates for cooking shellfish and one was probably remains of a windbreak (see also Cairns 1974).

SFB2/1

This was the largest shell midden in the a rea and covered approximately 50 square metres. Two small excavations of 1 square metre each were conducted at different localities (SFB2/1A & 1C). A small midden (SFB2/1B) at the bottom of the dune was also sampled. Excavation 1A yielded two layers of 0,15 m each divided by a sterile layer of black organic sand. Excavation 1C on the western side yielded three layers some 0,40 m thick. The two top layers were similar to those exposed on the northern side and contained pottery. Pottery was absent from layer three. A fully flexed infant burial was found on the eastern slope of the dune. The burial was facing in a north-easterly direction lying on its left side.

P. perna (between 48% [73%] and 63% [83%]) and *Oxystele* spp. (29% [11%] and 35% [14%]) were the dominant species in the two top layers at excavations 1A and 1C (Table 7). Other species were insignificant. The ERR for Layer 1 was 24,6% and for Layer 2, 28,1%. The remains of a number of large animals were found, including *Bos taurus*, *Syncerus caffer* and *Hippopotamus amphibius* (Table 8). Few cultural remains were recovered from both excavations (Tables 4 & 5). Many potsherds were found in excavation 1A, but probably all belong to a single spouted vessel (Table 5). Only a few quartzite flakes and shell beads were found.

Layer 3 in excavation 1C did not produce any pottery and dates to 1900 ± 50 BP (Pta-3910) (Fig. 6). D. *serra*, which was absent from the overlying two layers, was present in layer 3 (Table 7). Although only representing 3.4% [6,1%] of the total species, its contribution in meat mass is substantially higher than that of *Oxystele* spp. which comprised 14,5% of the percentage frequency. The presence of *D. serra* indicates that HCF also exploited the sandy beaches. The 'ceramic' groups did not collect this species. This pattern was visible at most of the 'ceramic' middens. *D. serra* is not present in any large numbers along this part of the coast today and similar conditions may have prevailed during prehistorical times. *T. sarmaticus* provided the second highest meat mass although it only represented 7,5% [14,4] of the shellfish collected. The ERR for Layer 3 was 35,5% which is notably higher than that of the 'ceramic' layers. Layer 3 yielded two stone features and a few silcrete stone tools (Table 4).

SFB2/1B

This midden covered approximately 4square metres and was dominated by *P. perna* (86,0% [95,8%]) (Table 6). No pottery was recovered. The size of the midden and the presence of species from the lower balanoid zone (*P. cochlear* and *P. argenvillei*) suggest that the site was occupied for a short time, probably for only a few days during spring low. It would appear that HCF preferred shellfish species with a higher meat mass per species from the lower balanoid zone to the more accessible, easy to collect *Oxystele* spp. (1%) from the upper balanoid zone. The ERR was 35,4%.

Fig. 5a (top). Windblown SFB2 Area with midden SFB2/1 in the background and SFB2/2 in the foreground, 1981. 5b (bottom). Area covered by branches, 1985.

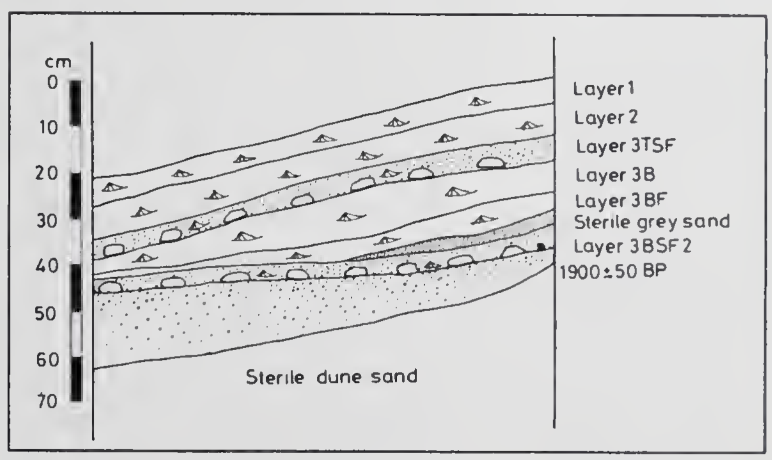

Fig. 6. Section drawing of the excavation at shell midden SFB2/1C.

Table 7. Shellfish frequency percentage per species and percentage meat mass contribution from middens of the SFB2 area.

	SFB2/1 L1[=]				SFB2/1 L2*				SFB2/1 L3[+]			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	1242	47,9	5599,3	73,2	1825	62,7	8577,5	82,9	2857	67,5	20570,4	72,5
Donax serra									142	3,4	1732,4	6,1
Patella argenvillei	11	0,4			7	0,2			11	0,3		
Patalla barbara	5	0,2							6	0,1		
Patella cochlear	28	1,1			16	0,6			45	1,1		
Patella longicosta	38	1,5			4	0,1			23	0,5		
Patella miniata					2	0,1			3	0,1		
Patella oculus	41	1,6			18	0,6			17	0,4		
Patella tabularis	10	0,4			2	0,1			19	0,5		
Haliotis spadicea	2	0,1			7	0,2			49	1,2	1063,3	3,7
Oxystele spp.	901	34,7	1072,4	14,0	844	29,0	1181,6	11,4	615	14,5	922,5	3,3
Turbo sarmaticus	219	8,4	979,2	12,8	118	4,1	590,0	5,7	315	7,5	4095,0	4,4
Burnupena spp.	79	3,0			20	1,8			104	2,5		
Solen capensis	3	0,1			42	0,4			17	0,4		
Dinoplax gigas	12	0,5			4	0,1			9	0,1		
TOTAL	2591	99,9	7650,9	100,0	2909	100,0	10349,1	100,0	4232	100,1	28383,6	100,0

	SFB2/1 L1[=]	SFB2/1 L2*	SFB2/1 L3[+]
Buckets sampled	14	17	28
Buckets analysed	14	17	28
Meat mass/volume	546,5	608,8	1013,7
Total collecting mass	31159,2	36785,9	79930,0
% meat mass of total mass/volume	**24,6**	**28,1**	**35,5**

	SFB2/1B[#]				SFB2/2[+]				SFB2/5[#]			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	1694	86,0	13382,6	95,8	778	60,2	5973,0	59,4	3995	70,3	37867,5	84,0
Donax serra					195	15,1	2214,0	22,0	8	0,1		
Patella argenvillei	22	1,1			23	1,8			32	0,6		
Patalla barbara	4	0,2			1	0,1						
Patella cochlear	69	3,6			16	1,2			71	1,3		
Patella longicosta	7	0,4			14	1,1			9	0,2		
Patella miniata	6	0,3			15	1,2						
Patella oculus	9	0,5			28	2,2			17	0,3		
Patella tabularis	2	0,1			2	0,2			8	0,1		
Haliotis spadicea	11	0,6	291,5	2,1	9	0,7			139	2,4	4059,1	9,0
Oxystele spp.	68	3,5			59	4,6			940	16,5	1659,0	3,7
Turbo sarmaticus	19	1,0	300,2	2,1	98	7,6	1860,1	18,5	79	1,4	1485,0	3,3
Burnupena spp.	14	0,7			17	1,3			370	6,5		
Solen capensis					5	0,4			12	0,2		
Dinoplax gigas	36	1,9			31	2,4			3	0,1		
TOTAL	1961	99,9	13974,3	100,0	1291	100,1	10047,1	99,9	5683	100,0	45070,6	100,0

	SFB2/1B[#]	SFB2/2[+]	SFB2/5[#]
Buckets sampled	14	14	25
Buckets analysed	14	14	25
Meat mass/volume	998,2	717,7	1802,8
Total collecting mass	39511,1	32329,8	125943,8
% meat mass of total mass/volume	**35,4**	**31,1**	**35,8**

Pottery and *Bos taurus* * Pottery present [+] Silcrete microlithic stone tools present [#] Kabeljous Industry

Only those shellfish species which contributed relatively high meat mass are considered.

Table 8. Faunal remains from SFB2 and Dune Field areas.

	SFB2/1			SFB2	Dune Field area		
	L1	L2	L3	SFB2/2	SFB2/5	SFB4	SFB8
MAMMALS							
Homo sapiens	1						
Arctocephalus pusillus	2	1	1				1
Equus sp.	1						
cf. Canis mesomelas	1						
Hippopotamus amphibius	1						
Raphicerus melanotis	1						
Raphicerus sp.	1			1	1		1
Syncerus caffer	1						
Lepus sp.	1						
Hystrix africae-australis	1						
Bos Taurus	1						
Bovidae - general							
small medium				1			
large medium				1	1		
large						1	
TOTAL	12	1	1	3	2	1	2
REPTILES (tortoise)						*	

SFB2/2

This midden was badly eroded by wind action. It was situated on a high dune and only 5 square metres of the deposit remained. A large number of silcrete microlithic stone tools were collected from both the surface and a small excavation (Table 4). All the elements from the inland Wilton Industry were present except for segments. Several *D. serra* pendants were also recovered (Table 5). A shell sample from this site has been radiocarbon dated to 4250 ± 70 BP (Pta-5042) (true date). *P. perna* (60,2% [59,4%]) and *D. serra* (15,1% [22,0%]) were the most abundant species (Table 7). It is evident that HCF also exploited the nearby sandy beach and ignored *Oxystele* spp. (4,6% [1%]). The ERR was 31,1%.

SFB2/5

This small midden covered approximately fifteen square metres and was 0,20 m thick. Rough, large surface quartzite (coarse grained silcrete) stone tools which were probably from hunter-gatherer origin were recovered (Table 4). *P. perna* (70,3% [84,0%]) and *Oxystele* spp. (16,5% [3,7%]) were the dominant species (Table 7). *H. spadicea* accounted for only 2,4% of the percentage frequency, but provided the second highest meat mass [9,0%]. The ERR was 35,8%.

SFB3

A large number of silcrete stone tools were collected from the surface of this eroded midden. All the microlithic elements of the Wilton Industry were present except for segments (Table 3).

DUNE FIELD AREA

The middens in the Dune Field area were located opposite a wave coast flanked by two small boulder beaches (Fig. 2). *P. perna* is not abundant along this part of the coast and only increases in number near Cape St Francis Point. It is assumed that collecting of this species took place in the SFB2 Area some 0,5 km away. This area has also been subject to large scale development since 1984.

SFB4 & 6

Both these middens were damaged by illegal digging and off road vehicles. They were sampled to establish the shellfish content. *P. perna* was the dominating species with 44,5% [65,8%] and 49,5% [64,7%] respec-tively (Table 9). *Oxystele* spp., 16,3% [4,1%] and 20,4% [4%] accounted for the second highest frequency, but indicated that HCF also exploited the sandy beaches. *D. serra* may have been collected opportunistically when the beach was searched for wash-ups such as fish, marine birds, seals and whales.

The same may be true for *Solen capensis* found in the deposits, which are only to be found at the Kromme River estuary some 5 km away. Pottery was absent from these middens. Only quartzite stone tools were found at both middens (Table 3). The ERR's for SFB4 was 30,7% and for SFB6 34,2%. SFB4 was dated to 4160 ± 60 (Pta-7550) and represent the oldest date for open-air middens associated with the Kabeljous Industry in the research area (Table 2).

SFB8 & 9

The surface samples taken from both these middens (see Binneman 2001, fig. 4a) were dominated by *P. perna*

Table 9. Shellfish frequency percentage per species and percentage meat mass contribution from the Dune Field area middens.

	SFB4#				SFB6#			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	929	44,5	9197,1	65,8	768	49,5	5683,2	64,7
Donax serra	24	1,2			3	0,2		
Patella argenvillei	41	2,0			2	0,1		
Patalla barbara	6	0,3			5	0,3		
Patella cochlear	114	7,4	569,8	4,1	53	3,4		
Patella longicosta	48	2,3			63	4,1		
Patella miniata					3	0,2		
Patella oculus	47	2,3			40	2,6		
Patella tabularis	22	1,1			41	2,6	471,5	5,4
Haliotis midae	8	0,4			4	0,3		
Haliotis spadicea	20	1,0			33	0,9	564,7	6,4
Oxystele spp.	341	16,3	579,7	4,1	317	2,1		
Turbo sarmaticus	158	7,6	3634,0	26,0	94	20,4	2068,0	23,5
Burnupena spp.	227	10,9			120	6,1		
Solen capensis	2	0,1				7,7		
Dinoplax gigas	62	3,0			6	0,4		
TOTAL	2089	100,2	13980,6	100,0	1552	100,0	8787,4	100,0

	SFB4#	SFB6#
Buckets sampled	9	9
Buckets analysed	19	9
Meat mass/volume	1553,4	976,4
Total collecting mass	45505,5	25690,3
% meat mass of total mass/volume	**30,7**	**34,2**

	SFB8/9#				SFB10A*				SFB10B+			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	211	37,0	1814,6	50,9	1688	52,2	5401,6	60,6	123	26,2	799,5	13,8
Donax serra	5	0,9							11	2,2		
Patella argenvillei	17	3,0			23	0,7			8	1,7		
Patalla barbara	17	3,0			6	0,2			1	0,1		
Patella cochlear	185	32,4	647,5	18,2	480	14,8	960,0	10,8	62	12,2		
Patella longicosta	7	1,2			37	1,1			6	1,3		
Patella miniata					8	0,3						
Patella oculus	30	5,3			39	1,2			29	6,4		
Patella tabularis	25	4,4	595,0	16,7	2	0,1			66	13,6	1716,0	29,7
Haliotis midae	1	0.2							29	5,7	2813,1	48,7
Haliotis spadicea	5	0.9			7	0,2			11	2,0		
Oxystele spp.	6	1,1			599	18,5	838,6	9.4	51	12,0		
Turbo sarmaticus	23	4,0	506,1	14,2	251	7,8	1706.8	19,2	36	7.8	450,2	7.8
Burnupena spp.	18	3,7			85	2,6			26	4,5		
Solen capensis												
Dinoplax gigas	17	3.0			7	0,2			20	4,2		
TOTAL	571	100.1	3563.2	100.0	3234	100,0	8907,0	100,0	477	100,0	5778.8	100,0

	SFB8/9#	SFB10A*	SFB10B+
Buckets sampled	3	7	10
Buckets analysed	3	7	4
Meat mass/volume	1187,7	1272,4	1444,7
Total collecting mass	11382,5	35940,1	16558,2
% meat mass of total mass/volume	**31,3**	**24,8**	**34,9**

* Pottery present

\# Kabeljous Industry

\+ Silcrete microlithic stone tools present

Only those shellfish species which contributed relatively high meat mass are considered.

Table 10. Frequencies of worked shell and bone and pottery from the Dune Fields area, Seal Point, De Hoek, Tony's Bay and Goedgeloof middens.

	Dune Fields			Seal Point		De Hoek	TB	Goedgeloof					
	6	8	10A	SP1	SP2	DH8	FTS	C3/1	C3/2	C3/4	C3/5	C3/6	A8
MARINE SHELL													
Donax serra													
Pendants		1		1	3								
Scrapers													
Pend/scrapers													
Glycymeris sp.													
Beads										1			
Thias squasmosa													
Beads										1			
TOTAL		**1**		**1**	**3**					**2**			
OSTRICH EGGSHELL													
Fragments				1									
Beads			1	1	1					5			3
TOTAL			**1**	**2**	**1**					5			**3**
BONE													
Points	1												
Tubes								1					
Pendants								1		1			
TOTAL	**1**							**2**		**1**			
POTTERY													
Fragments			47			4	35	20	1	82	11	4	85
Rim								5	1	11	18	3	3
Rim decorated								5		12	2	2	1
Body decorated								14		33	6	6	14
Spouts							1	2	2	1			
Lugs								1				3	2
Bases													1
TOTAL			47			4	36	47	4	139	37	18	106

(37,0% [50,9%]) and *P. cochlear* (32,4% [18,2%]) (Table 9). *P. tabularis* (4% [14,2%]) also made a useful contribution to the meat mass. *Oxystele* spp. only contributed 1% of the total frequency. The shellfish species collected at these two middens illustrates that HCF ignored the small species such as *Oxystele* spp. in favour of species with a higher meat mass. The ERR was 31,3%.

The stone tools recovered from the surface of these two middens consisted of a typical quartzite Kabeljous industry, including flakes, cores, grindstones, rubbers and hammer stones (Table 4).

<u>SFB10A & B</u>

This was a large shellfish accumulation of some 40 metres in length on top of a high dune ridge and consisted of two middens (see Binneman 2001, fig. 4a). SFB10A yielded pottery (Table 10). *P. perna* (52,2% [60,6%]), *Oxystele* spp. (18,5% [9,4%]) and *P. cochlear* (14,8% [10,8%]) were the most important species (Table 9). Although *T. sarmaticus* only accounted for 7,8% of the total frequency, it contributed the second highest meat mass [19,2%]. This was the only 'ceramic' midden which displayed such a high percentage of *Patella* spp. No other 'ceramic' midden had more than 6%. The ERR of 24,8% is similar to other 'ceramic' middens in the area and lower than that of the HG and HCF middens.

SFB10B yielded silcrete microlithic stone tools, again lacking segments (Table 4). A burial dating to 5180 ± 65 (Pta-1089) BP was found in the vicinity of this midden (De Villiers 1974; Thackeray & Feast 1974). A shell sample from SFB10B has been radiocarbon dated to 3640 ± 60 BP (Pta-5055) (true date).

The dominant species collected was *Patella* spp., 35%, of which only *P. tabularis*, 13,6% [29,7%] made a significant meat mass contribution. *P. cochlear*, 12,2%, accounted for only 3% of the meat mass. *P. perna*, 26,2%

[13,8%] accounted for the single highest frequency. *Oxystele* spp., 12,0%, was also well represented, but its meat mass contribution [1%] was negligible. *Haliotis midae* which only accounted for 7,8% of the frequency collected, contributed the highest meat mass [48,7%] (Table 8). The ERR was 34,9%.

Discussion

Several interesting aspects emerge from this area. There are marked differences visible in the collecting strategies of the 'ceramic' groups, hunter-gatherer (Wilton groups) and hunter-collector-fishers (Kabeljous groups). However, these differences are not always consistent for the different groups. For example, SFB1/1 layer 5 (HCF occupation) (Table 6) yielded a high frequency of *Patella* spp., but none of the other HCF or HG middens in the SFB2 Area show a similar pattern (Table 7). On the other hand, none of the 'ceramic' middens show this pattern either, but the SFB2 area middens yielded high frequencies of *Oxystele* spp., while the SFB1/1 midden showed an opposite pattern. In general HG and HCF middens yielded low frequencies of *Oxystele* spp., with the HG middens the only sites which yielded relatively high numbers of *D. serra*. The species from the different types of middens in the Dune Field area show similar patterns to those in the adjacent SFB2 Area (Table 9). The 'ceramic' midden (SFB10A) yielded similar *Patella* spp. frequencies to the HCF (SFB8) and HG (SFB10B) middens, while the latter two middens show a similar pattern in the *Oxystele* spp. collected in the 'ceramic' midden. It is interesting to note that *D. serra* was present at all the Dune Field non-pottery middens (SFB4, 6, 8 and 9) but, absent from the pottery midden (SFB10A).

Percentage frequencies and meat mass frequencies can be misleading and do not always expose the important differences between shellfish collecting strategies. Economic return ratio's (ERR's) on the other hand provide more reliable information because they can be used as a tool to compare collecting strategies between different middens in the same habitat. The ERR's from the 'ceramic' layers at SFB1/1 (Table 6) are the highest recorded for these middens in the research area and range between 32,8% and 37,6%. The reason is that 'ceramic groups' collected mainly *P. perna* and *Oxystele* spp. The Kabeljous layer at SFB1/1 on the other hand, has an ERR of 45,5% which is notably higher than the 'ceramic' layers. This indicates clearly that the collecting strategy of the Kabeljous group was far more economical than that of the 'ceramic' groups for the same habitat. A similar pattern is visible in the SFB2 area. The ERR's for the 'ceramic' midden (SFB2/1 L1 & 2) (24,6% & 28,1%) are lower than that of the Kabeljous (SFB2/1B & SFB2/5) (35,4% & 35,8%) and Wilton middens (SFB2/1 L3 & SFB2/2) (35,5% & 31,1%) (Table 7). The same pattern is also visible at the Dune Field area. The 'ceramic' midden (SFB10A) has a ERR of 24,8% which is notably lower than that of the Kabeljous and Wilton middens which have ERR's higher than 30%.

The oldest date for the presence of pottery (1770 $\pm$ 50 BP) along the south-eastern Cape coast comes from SFB1/1 Layer 4. No domestic fauna were associated with this midden. The remains of one *Bos taurus* was recovered from SFB2/1, but this is not regarded to be a true pastoralist site. The date of 1900 $\pm$ 50 BP from SFB2/1C is important because it is the most recent date for a Wilton site along the this part of the study area. The charcoal sample submitted for radiocarbon dating was collected 0,25 m below the 'ceramic' layers from a fire place, and therefore rules out contamination. The microlithic silcrete industry which dates between 1900 BP and 4250 BP, indicates that hunter-gatherer groups, most probably from the Langkloof some 80 km due north of Cape St Francis, visited the coast occasionally (Binneman 1985). There are no known silcrete outcrops along the coast and therefore it is assumed that the silcrete was brought to the coast from the mountains where there are abundant known silcrete resources (W. Illenberger pers. comm.; pers. obser.). This indicates that two different groups, the inland Wilton and coastal Kabeljous, shared the same area and resources.

GOEDGELOOF AREA

Approximately five kilometres from the St Francis Bay coast a large number of sites occur dating from the Late Pleistocene to recent pastoralist/'ceramic' occupation. The archaeological features were located in three clusters separated by huge dunes which move slowly eastward (Fig. 1). The archaeological features were situated on old hard windswept deflation surfaces (see Binneman 2001, figs11 & 13).

COMPLEX 1

This was a large windswept area with numerous archaeological features of different ages. Large areas with Middle Stone Age tools are regularly uncovered. Among these were several round caches of flaked stone. Other features included shell middens and round stone structures, probably of pastoralist/'ceramic' origin.

C1/M1

This midden as well as others in the vicinity was all hard and consolidated. Wind erosion had caused this midden to break-up in large blocks. A skeleton found in such a block has been radiocarbon dated to 2890 $\pm$ 60 BP (Pta-4066). The midden yielded a Kabeljous quartzite Industry with large segments and bored stones. A shell sample taken from this midden was dominated by *Solen capensis* (42,8% [62,7%]), followed by *P. perna* (20,7%, [17,5%]) and *D. serra* (13,6% [15,0%]) (Table 11). The ERR of 51,3% was the highest recorded for any Kabeljous midden in the research area.

The nearest source of *S. capensis* is at the Kromme River Mouth. *S. capensis* prefers clean sands of estuaries or lagoons where it burrows down to one metre deep near the low spring tide zone. The populations in the Kromme estuary are one of the largest in the eastern Cape (Heydorn & Morant 1988:61).

Table 11. Shellfish frequency percentage per species and percentage meat mass contribution from the Goedgeloof middens.

	C1/M1#				C2/M4#				C3/M4*			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	211	20,7	1582,5	17,5	192	21,3	1440,0	20,6	286	16,7	2145,0	12,0
Donax serra	139	13,6	1362,0	15,0	1	0,1			1	0,1		
Patella argenvillei	13	1,3			35	3,9			14	0,8		
Patalla barbara	3	0,3			3	0,3						
Patella cochlear	54	5,3	167,4	1,8	198	22,0	613,8	8,8	15	0,9		
Patella longicosta	5	0,5			12	1,3			16	0,9		
Patella miniata					2	0.2						
Patella oculus	10	1,0			13	1,4			2	0,1		
Patella tabularis					1	0,1						
Haliotis spadicea	3	0,3	133,1	1,5	4	0,5						
Oxystele spp.	121	11,8			37	4,1			100	5,9		
Turbo sarmaticus	12	1,2	134,4	1,5	109	12,1	1253,5	17,9	30	1,8		
Burnupena spp.	14	1,3			3	0,3			1	0,1		
Solen capensis	437	42,8	5681,0	62,7	290	32,2	3683,0	52,7	1242	72,7	15773,4	88,0
Dinoplax gigas					1	0,1						
TOTAL	1022	100,1	9060,4	100,0	900	99,9	6990,3	100,0	1707	100,0	17918,4	100,0

	C1/M1	C2/M4	C3/M4
Buckets sampled	4	2	6
Buckets analysed	4	2	6
Meat mass/volume	2266,5	3595,2	2986,4
Total collecting mass	4412,0	8852,9	4791,4
% meat mass of total mass/volume	**51,3**	**39,5**	**62,5**

Kabeljous Industry
* Pottery and sheep

Only those shellfish species which contributed relatively high meat mass are considered.

COMPLEX 2

Several large middens similar to those at complex 1 were present in this area. All the middens yielded a Kabeljous quartzite Industry with large segments (Table 12).

C2/M4

The shell sample taken from this midden was also dominated by *S. capensis* (32,2% [52,7%]), followed by *P. cochlear* (22,0% [8,8%]) and *P. perna* (21,3% [20,6%]). *D. serra* was of little importance to the diet (Table 11). The ERR was 39,5%.

COMPLEX 3

This area comprised mainly pastoralist sites. Large numbers of sheep remains and pottery (Fig. 7) were collected from a cluster of middens (Table 13 & 10). A small surface sample from the area yielded remains of 117 sheep and nine *Bos taurus*. Several cooking platforms were also found between the middens.

C3/M4

This midden was some 70 metres long and 20 metres wide. A small sample was taken to establish the shellfish content. *S. capensis* (72,7% [88,0%]) was the dominant species, followed by *P. perna* (16,7% [12,0%]) (Table 11). The ERR of 62,3% was the highest recorded for the research area. The midden has been radiocarbon dated to 1270 ± 50 (Pta-4616) BP.

Discussion

The data collected from the Goedgeloof middens indicate that the distance from the coast played an important role in the choice of shellfish. The remains indicate that collecting trips were undertaken mainly during new and full moon phases to take maximum advantage of the low tide. *S. capensis* was the most important species collected by both the HCF and pastoralist groups. When the total collected shellfish weight, the edible meat mass and transport distance are taken into account, it is evident (Table 10) that the groups that lived far from the coast (5 km) were far more economical in their selection of shellfish species than those groups that lived along the immediate coast. Pastoralists (C3/M4) practised the most economic shellfish collecting strategy with 62,3 % of the total weight being edible. The Kabeljous groups, although notably lower than the pastoralists, also collected and transported a relatively high edible shellfish meat mass percentage. At C1/M1 (edible meat mass of 51,3%) a lower percentage of *S. capensis* was collected and a higher percentage of *P. perna* and *D. serra*. The latter two species were responsible for the lower percentage of edible meat mass per total

Table 12. Frequencies of stone artefacts from Seal Point, De Hoek, Tony's Bay Goedgeloof and Thysbaai middens.

	Seal Point		De Hoek		TB	Goedgeloof					Thysbaai	
	SP1	**SP2**	**DH2**	**DH8**	**FTS**	**C1/1**	**C2/4**	**C3/1**	**C3/2**	**C3/4**	**WM1**	**WM2**
WASTE												
Chips		2										
Chunks	1	9									2^*	6^*
Small cores											23^*	52^*
Cobble cores	2		1			1						
CRP											3^*	8^*
Flakes	5	72	2	4	4	8	2			2	100^*	234^*
TOTAL	**8**	**83**	**3**	**4**	**4**	**9**	**2**			**2**	**128**	**300**
UTILISED												
Hammerstones							1					
Hammer/rubber								2				
Rubbers	2											
Milled edge												1
Flakes						4					6^*	14^*
TOTAL	**2**					**4**	**1**	2			**6**	15
FORMAL											4^*	14^*
Scrapers											2^*	2^*
Adzes												1^*
Borers												1^*
Backed flakes												
Large segments						13	10					
Bored stones						3^+						
Sinkers						1^+			$1^\#$			
Misc. retouched						5					3^*	4^*
TOTAL						**22**	**10**		**1**		**9**	**22**
OTHER												
ochre	1	1		1								

All quartzite unless indicated differently.

* Silcrete $^+$ Hornfels $^\#$ Calcrete

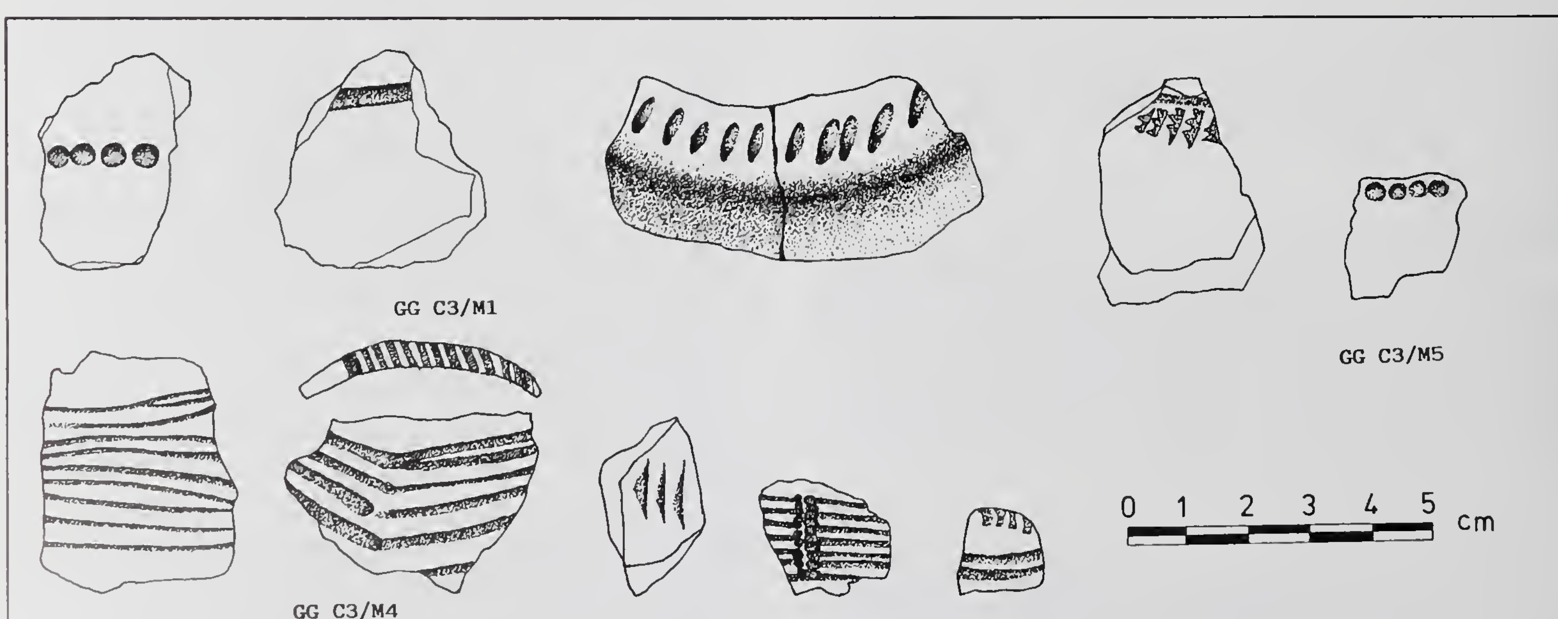

Fig. 7. Decorated pottery from Goedgeloof Complex 3.

Table 13. Minimum numbers of faunal species from the Goedgeloof middens.

	C1/M1	C2/M4	C3/M1	C3/M3	C3/M5	C3/M6	C3/8
MAMMALS							
Canis sp.				1			
Felis sp.				1			
Panthera leo		1					
Arctocephalus pusillus				1			
Diceros bicornis			1	1			
Equus sp.					1		
Hippopotamus amphibius	1	1		1			1
Raphicerus sp.			1	3	1		
Alcelaphus buselapus	1			2	1	2	1
Silvicapra grimmia				1			
Damaliscus sp.							1
Tragelapus strepsiceros				1			
Syncerus caffer		2		1			
Lepus sp.				1			
Ovis aries							
fetus				2			
juvenile			4	8			
sub-adult			4	8		1	
adult			22	22		17	
old			5	12	1	8	3
cf. Bos Taurus				3	3		3
Bovidae - general							
Small				1			
small medium				1		1	
large medium		1	1	1			
large		1		2		1	
TOTAL	**2**	**6**	**38**	**74**	**7**	**30**	**9**
REPTILES (tortoise)							
Homopus areolatus	3		2	1		1	1
MARINE BIRDS							
P. c. lucidus					1		
M. capensis					1		
S. demersus		1			1		
TOTAL		**1**		**1**	**3**		

weight. An even lower percentage of *S. capensis* was collected at C2/M4 (edible meat mass of 39,5%), but a higher *P. perna* percentage. *D. serra* is virtually absent and a higher percentage of *T. sarmaticus* was collected instead, which is responsible for the substantial lower edible meat mass per total weight.

The shellfish remains from all three complexes indicate that the collectors visited different coastal habitats on a regular basis. Collectors would have had to travel a minimum distance of 10 km each time they visited the Kromme River Mouth or the nearest rocky shore. It is also possible that they collected from all three habitats on each trip. A round trip would have been some 14 km, starting either at the river mouth or at the rocky shore. If they started at the river mouth, where they collected *S. capensis*, they would have had to travel another 4 km along the sandy beach to the nearest rocky outcrops. Along the sandy beach they would have collected *D. serra* and at the rocky shore mostly P. perna (as in the case of C1/M1). Virtually no *D. serra* was present at the other two areas. The high frequency of *P. cochlear* at C2/M2, indicates that the trips to the coast, or at least those to the rocky shore, were undertaken during spring tide low. The pastoralists at C3/M4 concentrated only on two species, *S. capensis* and *P. perna* and did not collect *Oxystele* spp. as the 'ceramic' groups did.

The remains of 117 sheep and nine *Bos taurus* recovered from complex 3 (mainly surface collections) place this area

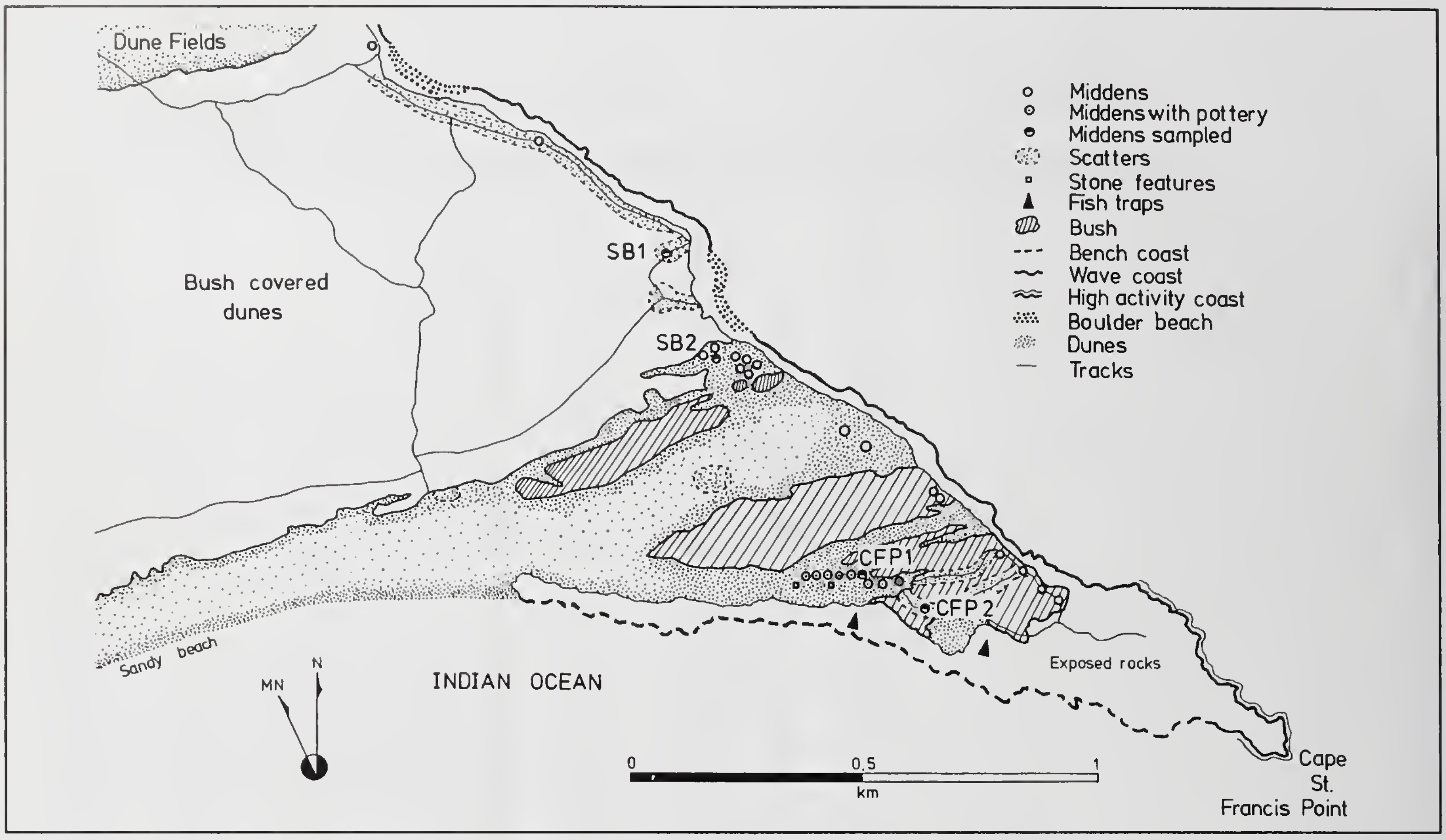

Fig. 8. Map of the archaeological sites and features at Second Bush and Cape St Francis Point..

among the richest Stone Age pastoralist sites in southern Africa. Sixty one of the individuals were adults based on tooth wear studies (J. Brink, pers. comm.). This pattern is different from that found at other pastoralist sites in southern Africa. At Boomplaas Cave (Von den Driesch & Deacon 1985), Kasteelberg and Die Kelders (Klein 1986) most of the remains are those of young to very young animals. The sheep remains from complex 3 represent animals which were necessary to ensure flock viability. The reason for the slaughter of reproductively active adults is not known as yet, but it may be related to social practices. Apart from herding domesticated animals, the pastoralist also hunted a high number of terrestrial animals (Table 13).

SECOND BUSH AREA

The Second Bush middens were situated between the Dune Field area and Cape St Francis Point and located at a large boulder beach (Fig. 8). Many middens were exposed in tracks crossing through former dune fields now covered by dense dune vegetation. The 'ceramic' middens in these two areas did not yield any remains of domesticated animals. Two surface samples were taken in this area (SB1 & 2). SB1 was situated on the northern side of a boulder coast (SFB area side), and SB2 on the southern side of the same boulder coast (Cape St Francis Point side) (Fig. 8). The samples were taken to illustrate the different collecting strategies between 'ceramic' groups and HCF in the same habitat.

SB1 & 2

SB1 was eroded from a road cutting on the northern side of the boulder beach and was dominated by species from the lower balaniod zone. *P. cochlear*, 27,4% [20,3%] was the most important species, followed by *Oxystele* spp., 14,6% and *P. tabularis*, 9,9% [17,8%]. However, *H. midae* (0,5%, [23,4%]) and *H. spadicea* (5,2%, [23,5%]) contributed the highest meat mass (Table 14). The ERR was 32,3%.

SB2 was a 'ceramic' midden situated on the southern side of the boulder beach and displayed different shellfish frequencies to that of SFB1. *Oxystele* spp., 29,4% [10,1%] was the most important species, followed by *P. perna*, 17,2% [35,6%] and *Burnupena* spp., 15,6% (Table 14). *T. sarmaticus* was represented by a low frequency (7,8%), but contributed 29,7% of the meat mass. The ERR was 25,9%.

CAPE ST FRANCIS POINT AREA

A large number of shell middens and stone features were situated in the small nature reserve at Cape St Francis Point (Fig. 8 & 9). No excavations were conducted here, but two middens, one with pottery and one without, were sampled for shellfish comparisons. The Point area is a high activity coast with a bench coast on the western side. Two possible fish traps were also found and may be those reported by Goodwin (1946).

CFP1 & 2

CFP1 (Fig. 8) was associated with pottery and the shellfish content was dominated by *Oxystele* spp., 66,1% [20,6], followed by *T. sarmaticus*, 17,7% [61,0%] and *P. oculus*, 12.1% [18,5%] (Table 14). The ERR was 22,7%. It is evident that the 'ceramic' group only exploited the upper

Table 14. Shellfish frequency percentage per species and percentage meat mass contribution from Second Bush and Cape St Francis middens.

	SB1#				SB2*				CSFP*				CSFP#			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	6	2,8			62	17,2	446,4	35,6	5	1,0			149	41,5	1132,4	52,0
Donax serra	3	1,4														
Patella argenvillei	12	5,7			1	0,3			1	0,2			5	1,4		
Patalla barbara	16	7,5			6	1,7			2	0,4			3	0,8		
Patella cochlear	58	27,4	162,4	20,3	40	11,1	112,0	8,9	1	0,2			18	5,0		
Patella longicosta	12	5,7			7	1,9			1	0,2			24	6,7		
Patella miniata	1	0,5			1	0,3			1	0,2			1	0,3		
Patella oculus	20	9,4			31	8,6	195,3	15,6	58	12,1	342,2	18,5	33	9,2	270,6	12,4
Patella tabularis	21	9,9	142,8	17,8	7	1,9										
Haliotis midae	1	0,5	184,4	23,4												
Haliotis spadicea	11	5,2	188,1	23,5												
Oxystele spp.	31	14,6			106	29,4	127,2	10,1	318	66,1	381,6	20,6	66	18,4		
Turbo sarmaticus	9	4,2	119,7	15,0	28	7,8	372,4	29,7	85	17,7	1130,5	61,0	58	16,2	771,4	35,5
Burnupena spp.	5	2,4			56	15,6			9	1,9			2	0,6		
Dinoplax gigas	6	2,8			15	4,2										
TOTAL	212	100,0	800,4	100,0	360	100,0	1253,3	99,9	481	100,1	1854,3	100,1	359	100,1	2174,4	99,9

	SB1	SB2	CSFP*	CSFP#
Buckets sample	1	1	1	1
Buckets analysed	1	1	1	1
Meat mass/volume	800,4	1253,3	1854,3	2174,4
Total collecting mass	2632,3	4846,4	8151,0	7337,4
% meat mass of total mass/volume	**32,3**	**25,9**	22,7	**29,6**

* Pottery present # Kabeljous Industry

Only those shellfish species which contributed relatively high meat mass are considered.

Fig. 9. Shell middens in the dunes at Cape St Francis Point.

balaniod zone. Several other 'ceramic' middens in the vicinity display similar patterns. Some of the 'ceramic' middens contain many large quartzite flakes.

Pottery was absent from midden CFP2 and the shellfish content was also different from the 'ceramic' midden. P. perna, 41,5% [52,0%], was the dominating species, followed by *Oxystele* spp., 18,4% and *T. sarmaticus*, 16,1% [35,5%] (Table 14). Although the HCF also concentrated mainly on the upper balaniod zone, they also exploited the lower. *Patella* spp. accounted for 23% of the total frequency, while in the case of the 'ceramic' midden, it only accounted for 13%. The ERR was 29,6%.

Discussion

The middens sampled at Second Bush and Cape St Francis Point clearly indicate the different collecting strattegies employed between HCF and 'ceramic' groups occupying a similar coastal habitat. At Second Bush the HCF collected extensively from the lower balaniod zone, indicating that they exploited shellfish only at certain times of the tidal cycle (spring and neap low). Although the 'ceramic' groups also collected from the lower balaniod zone, their use of this zone was substantially less than the HCF. They also concentrated more on collecting species from the upper balaniod zone. The ERR for the Kabeljous midden (SB1) is 32,3%, which is notably higher than that of the 'ceramic' midden (SB2) (25,9%).

The shellfish collecting pattern as observed from the 'ceramic' midden at Cape St Francis Point indicates that these groups mainly collected those species which were to be found in the shallow intertidal pools. They generally collected limpets such as *P. oculus*, but not limpets from the lower balanoid zone. They also did not exploit the *P. perna* beds on the eastern side of the Point (a few hundred metres from the middens). The HCF on the other hand, collected *P. perna* from this part of the coast. It would appear that

Table 15. Shellfish frequency percentage per species and percentage meat mass contribution from the Seal Point middens.

	SP1#				SP2#				SP3#	
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %
Perna perna	131	4,3	1218,3	10,1	216	8,8	1620,0	15,5	2	1,9
Donax serra	22	0,7			53	2,2	514,1	4,9		
Patella argenvillei	144	4,7	1008,0	8,4	188	7,7	1560,4	14,9	8	7,6
Patalla barbara	22	0,7			9	0,4			8	7,6
Patella cochlear	450	14,7	1260,0	10,4	740	30,2	2442,0	23,3	16	15,2
Patella longicosta	706	23,1	2118,0	17,6	277	11,3	997,2	9,5	12	11,4
Patella miniata	3	0,1			2	0,1			3	2,9
Patella oculus	344	11,3	2029,6	16,8	136	5,6	802,4	7,6	6	5,7
Patella tabularis	36	1,2			25	1,0	435,0	4,1	28	26,7
Haliotis midae					3	0,1			4	3,8
Haliotis spadicea	3	0,1			22	0,9	473,0	4,5	1	1,0
Oxystele spp.	895	29,3	1342,5	11,1	655	26,7	786,0	7,5	4	3,8
Turbo sarmaticus	255	8,4	3085,5	26,6	72	2,9	846,0	8,1	11	10,5
Burnupena spp.	38	1,1			44	1,8				
Dinoplax gigas	5	0,2			6	0,2			2	1,9
TOTAL	3054	99,9	12061,9	100,02	2448	99,9	10476,1	99,9	105	100,0

	SP1	SP2	SP3
Buckets sampled	16	20	1
Buckets analysed	16	20	1
Meat mass/volume	753,9	523,8	
Total collecting mass	47849,1	36187,9	
% meat mass of total mass/volume	**25,2**	**28,9**	

Kabeljous Industry

Only those shellfish species which contributed relatively high meat mass are considered.

'ceramic' groups either preferred *Oxystele* spp. to *P. perna* when they had the choice, or they did not make the effort to travel a few hundred metres further to collect higher meat mass species. It is also anomalous that they collected certain limpets and not others. The ERR for the Kabeljous midden (CSFP1) of 29,6% was higher than that of the 22,7% of the 'ceramic' midden (CSFP2).

SEAL POINT AND DE HOEK AREAS

Seal Point

Most shell middens in this area were either destroyed or covered by houses and gardens, but a few were still visible between the houses in the holiday resort of Cape St Francis. On the northern side of Seal Point is a sandy beach and a boulder beach. The Point mainly consists of a high energy coast (Fig. 10). Two HCF middens (SP1 & 2) were excavated and one sampled (SPB). No suitable pastoralist/ 'ceramic' middens were found for sampling.

SP1 and 2

The two excavated middens were situated on the northern side of the boulder beach (Fig. 10). Both middens comprised mainly *Patella* spp. (Table 15). In the case of SP1, *P. longicosta* (23,1% [17,6%]), *P. cochlear* (14,7% [10,4%]) and *P. oculus* (11,3% [19,8%]) represented the important species. *Oxystele* spp. accounted for 29,3% [11,1%] and *P. perna* only 4,3% [10,1%]. *T. sarmaticus*, although it only accounted for 8,4% of the total frequency, contributed the highest meat mass [25,6%].

P. cochlear (30,2% [23,3%]) was the dominating species at SP2, followed by *Oxystele* spp. (26,7% [12,3%]). *P. perna* (8,8% [15,5%]) and *P. argenvillei* (7,7% [14,9%]) were the other main contributors to the total meat mass (Table 15). Pottery was absent from both middens. The ERR's (25,2% & 28,9%) for both middens were low and fall within the `ceramic' range.

SP3

The shellfish sample taken from this midden, exposed in a road cutting directly opposite the boulder coast, was dominated by *P. tabularis*, 26,7%, followed by *P. cochlear*, 15,2% (Table 15). This midden is an excellent example of HCF collecting strategies. They ignored the small *Oxystele* spp. 3,8%, and collected the larger species from the lower balaniod zone. Other high meat mass species included *P. argenvillei*, 7,6%, *Haliotis* spp., 4,8% and *T. sarmaticus*, 10,5%.

De Hoek

A complete survey of all visible archaeological sites was carried out in this area (Fig. 10). A large number of sites occurred along three kilometres of coast, most only visible in road cuttings. Several middens were sampled to contrast shellfish content between 'ceramic' and HCF middens (Tables 14 & 15). Some three kilometres west of Seal Point

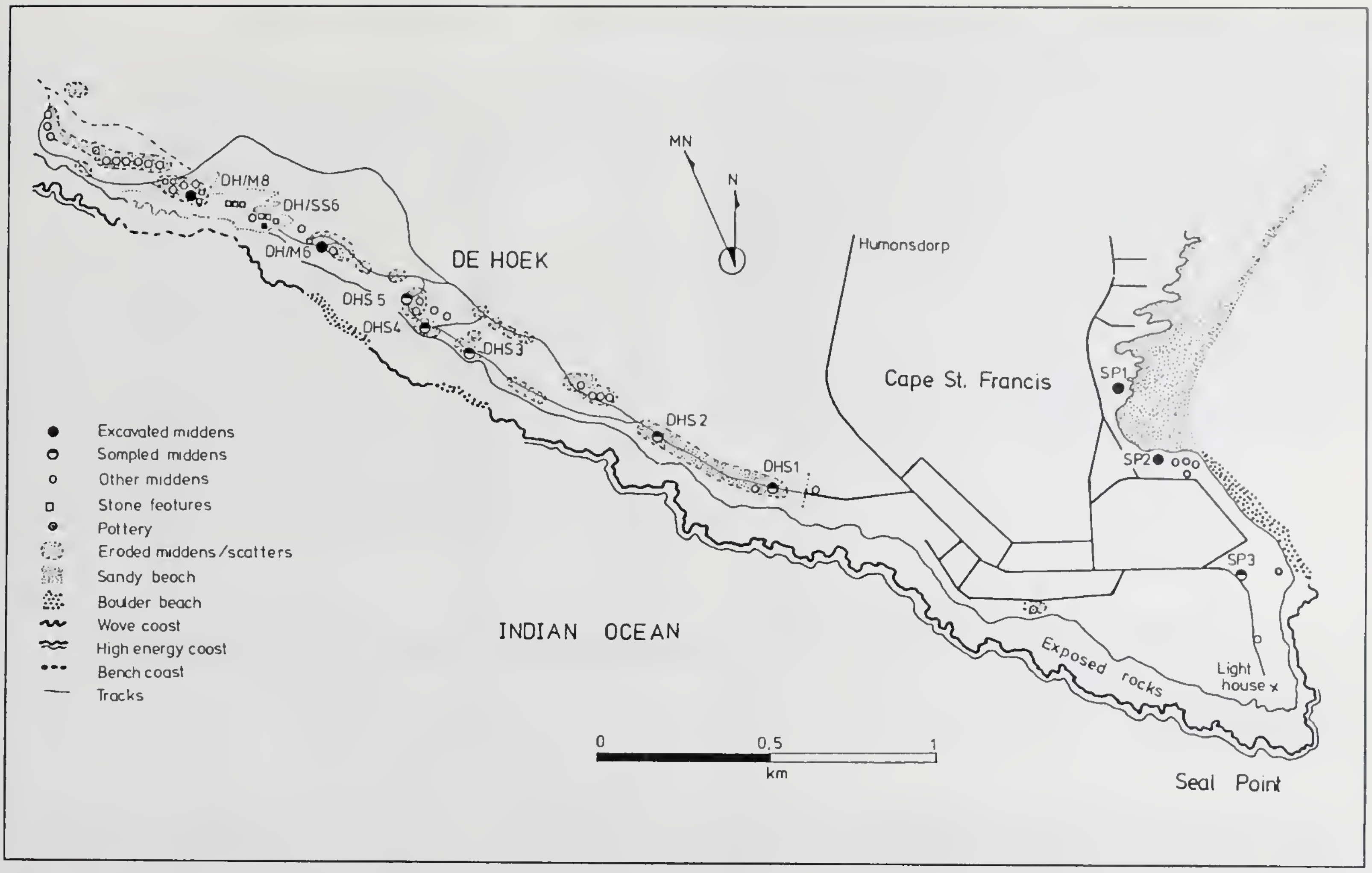

Fig. 10. Map of the archaeological sites and features at Seal Point and De Hoek.

Fig. 11. Shell middens in the dunes at De Hoek.

was a large concentration of middens and stone features (Fig. 11). Three small excavations were conducted there.

DH1 & 2

Two samples were taken from HCF middens adjacent to a high activity coast (Fig. 10). Both were dominated by *Patella* spp., mainly *P. cochlear* (55,8% and 44,3% respectively) (Table 15). *P. perna*, 16,5% and *P. argenvillei*, 15,6%, were also collected in fair numbers at DH1. At DH2 however, *Oxystele* spp., 16,5% and *T. sarmaticus*, 13,7% account for the next highest species. This midden was close to a boulder coast, and this may be the reason for the high frequencies of *Oxystele* spp. and *T. sarmaticus*.

DH3 & 4

Both these middens were of 'ceramic' origin, situated near a boulder coast. *Oxystele* spp. (74,9% and 53,8% respectively) were the most important species (Table 15). *Patella* spp. and other shellfish species were only present in low frequencies.

DH5

This HCF midden was situated next to DH3 and 4 ('ceramic' middens), but displayed a different collecting strategy. The main shellfish species were *P. cochlear*, 26,8% and *T. sarmaticus*, 20,5% (Table 15). Other species from the lower balaniod zone such as *P. tabularis*, 10,0% and *P. longicosta*, 10,5%, were also present. *Oxystele* spp., 5,3%, were largely ignored.

DH/M6

A small excavation was conducted at this badly damaged HCF midden. The midden was situated near a boulder and bench coast. The two most important species were *P. perna* (43,1% [54,1%]) and *P. cochlear* (2,9% [12,3%]) (Table 22). *Oxystele* spp. only comprised 12,3% [3%] of the total frequency. The ERR was 33,8.

DH/M8

Half a kilometre west of DHS2 a large concentration of

Table 16. Shellfish frequency and frequency percentage per species contribution from the De Hoek middens.

	DH1#		DH2#		DH3*		DH4*		DH5#	
	f	f %	f	f %	f	f %	f	f %	f	f %
Perna perna	56	16,5	11	3,1	20	4,3	16	5,5	7	3,7
Donax serra	6	1,8							1	0,5
Patella argenvillei	53	15,6	32	9,0	25	5,4	13	4,5	14	7,4
Patalla barbara	1	0,3	5	1,4	1	0,2	2	0,7	3	1,6
Patella cochlear	189	55,8	158	44,3	6	1,3	25	8,6	51	26,8
Patella longicosta	6	1,7	18	5,0	3	0,6	3	1,0	20	10,5
Patella miniata	2	0,6	1	0,3	1	0,2			7	3,7
Patella oculus	5	1,5	13	3,6	34	7,3	19	6,6	10	5,3
Patella tabularis	2	0,6	9	2,5					19	10,0
Haliotis midae			1	0,3	1	0,2			2	1,1
Haliotis spadicea	2	0,6			1	0,2	4	1,4	1	0,5
Oxystele spp.	6	1,8	59	16,5	349	74,9	156	53,8	10	5,3
Turbo sarmaticus	7	2,1	49	13,7	14	3,0	46	15,9	39	20,5
Burnupena spp.	2	0,6			11	2,4	6	2,1	2	1,1
Dinoplax gigas	2	0,6	1	0,3					4	2,0
TOTAL	339	100,1	357	100,0	466	100,0	290	100,1	190	100,0

	DH1#	DH2#	DH3*	DH4*	DH5#
Buckets sampled	1	1	1	1	1
Buckets analysed	1	1	1	1	1

	DH/M6#				DH/SS6*				DH/M8*			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	1015	43,1	7917,0	54,1	19	6,2	121,5	12,3	32	1,7	185,6	4,1
Donax serra	4	0,2										
Patella argenvillei	202	8,6	1414,0	9,7					6	0,3	72,0	1,6
Patalla barbara	2	0,1										
Patella cochlear	517	21,9	2068,0	14,1					7	0,4		
Patella longicosta	48	2,0							8	0,4		
Patella miniata	6	0,3										
Patella oculus	20	0,9			4	1,3			119	6,3	785,4	17,3
Patella tabularis	10	0,4										
Haliotis midae	4	0,2										
Haliotis spadicea	60	2,5	1998,0	13,6	1	0,3			4	0,2		
Oxystele spp.	291	12,3			246	80,7	344,4	34,7	1570	82,6	2041,0	45,0
Turbo sarmaticus	94	4,0	1250,2	8,5	35	11,5	525,0	53,0	146	7,7	1460,0	32,0
Burnupena spp.	83	3,5							8	0,4		
Dinoplax gigas	3	0,1							1	0,1		
TOTAL	2359	100,1	14647,2	100,0	305	99,9	990,9	100,1	1909	100,1	4544,0	100,0

	DH/M6#	DH/SS6*	DH/M8*
Buckets sampled	10	10	6
Buckets analysed	10	10	6
Meat mass/volume	785,3	99,1	757,3
Total collecting mass	82823,4	4527,9	177703,3
% meat mass of total mass/volume	**33,8**	**21,9**	**25,7**

All grab samples

* Pottery present # Kabeljous

Only those shellfish species which contributed relatively high meat mass are considered.

middens and stone features associated with pottery were situated opposite a bench coast. A small excavation was conducted at one of the pottery middens to establish the shellfish content. The midden consisted mainly of *Oxystele* spp. (82,6% [45,0%]) and *Turbo sarmaticus* (7,7% [32,0%]) (Table 16). The ERR was 25,7%.

DH/SS6

This was a large stone feature eroding from a dune. A small excavation was carried out to investigate the feature (Binneman 2001, fig.18). Little shellfish, mainly *Oxystele* spp., 80,7 [34,7%]% and *T. sarmaticus*, 11,5% [53,0%], were recovered (Table 16). The ERR was 21,9%. Large quantities of charcoal were found between and underneath the fire cracked stones. This stone feature was probably a large hotplate for cooking shellfish. The feature has been radiocarbon dated to 290 ± 50 BP (Pta-3908).

Discussion

The ERR's of both middens at Seal Point are low (SP1, 25,2% and SP2, 28,9%) and are similar to that of 'ceramic' middens, for example, DH/M8 (25,7%) (Table 14). The reason being that *Patella* spp. contain a relatively low meat mass in relation to the shell size and weight. Large frequencies of *P. cochlear*, *P. longicosta* and *Oxystele* spp. are responsible for the low ERR's.

In the De Hoek area the shellfish samples from 'ceramic' and HFC middens indicated clearly that the two groups had different collecting strategies in the same habitats. 'Ceramic' groups preferred to collect easily available species from the upper balaniod zone such as *Oxystele* spp. and were generally not 'interested' in limpets or species from the lower balaniod zone. The HCF on the other hand, generally ignored small species and tended to collect from the lower balaniod zone that provided them species with higher meat mass per volume. This is evident from the ERR's (Table 14). The Kabeljous midden (DH/M6) has an ERR of 33,8% and the 'ceramic' midden (DH/M8) and stone feature (DH/SS6) 25,7% and 21,9% respectively.

THYSBAAI AND TONY'S BAY AREAS

Thysbaai

A large number of archaeological features were present east of Thysbaai and in the dune system adjacent to the coast (Figs 12 & 13). This dune system, now separated by vegetation, was once part of the main bypass system that stretches between Oyster Bay and St Francis Bay. On the eastern side of the sandy beach were a large number of shell middens, Middle Stone Age and Earlier Stone Age sites. A very dense mixed M.S.A. and E.S.A. site stretches along the crest of a fossilised dune over a distance of a kilometre (Binneman, 2001, fig. 6). Three types of middens occurred in the dunes, namely, those with pottery, those with a Kabeljous Industry and those with a microlithic silcrete Wilton Industry. The middens sampled were between one and 1,5 km from a high energy coast.

Fig. 12. Shell middens in the dunes overlooking Thysbaai.

TBW1

A surface collection of silcrete stone tools was made from this badly eroded midden. The collection revealed a high number of cores, while segments were absent (Table 12). A radiocarbon date of 1720 ± 50 (Pta-8653) was obtained for this midden.

TBW2

This was a large midden measuring approximately 65 x 15 m. The midden was situated on top of a high fossilised dune some 1,5 km from the coast. The midden carried a vast number of microlithic silcrete stone tools (Table 12). A sample of the shellfish was taken and a 15 minute surface collection of stone tools was also carried out. The assemblage also lacked segments, but yielded a large number of cores. A shell sample has been radiocarbon dated to 3760 ± 60 BP (Pta-5050) (true date). The sample was dominated by *P. cochlear*, 37,5% [22,3%] and *P. argenvillei*, 26,3% [27,2%] (Table 17). The ERR was 28,2%.

TBK2

This midden was part of a complex of middens stretching over a distance of some three hundred metres, and was situated about one kilometre from the coast. Apart from a few 'ceramic' middens, all revealed a Kabeljous Industry. The shellfish sample was dominated by *P. cochlear*, 49,1% [55,6%], *P. perna*, 11,4% [25,2%] and *T. sarmaticus* 5,1% [19,2%] (Table 17).The ERR was 27,8%

TBH3

This midden was one of a few 'ceramic' middens situated among HCF middens. The shellfish sample again illustrates the differences between 'ceramic' groups and HCF collecting strategies. *Oxystele* spp., 48,4% [13,8%] and *T. sarmaticus*, 29,8% [75,8%] were the two most important species (Table 17). Neither of these two species were collected in any great numbers at any of the HCF middens. The ERR was 22,7%.

Tony's Bay Area

The coastline between Oyster Bay and Thysbaai was

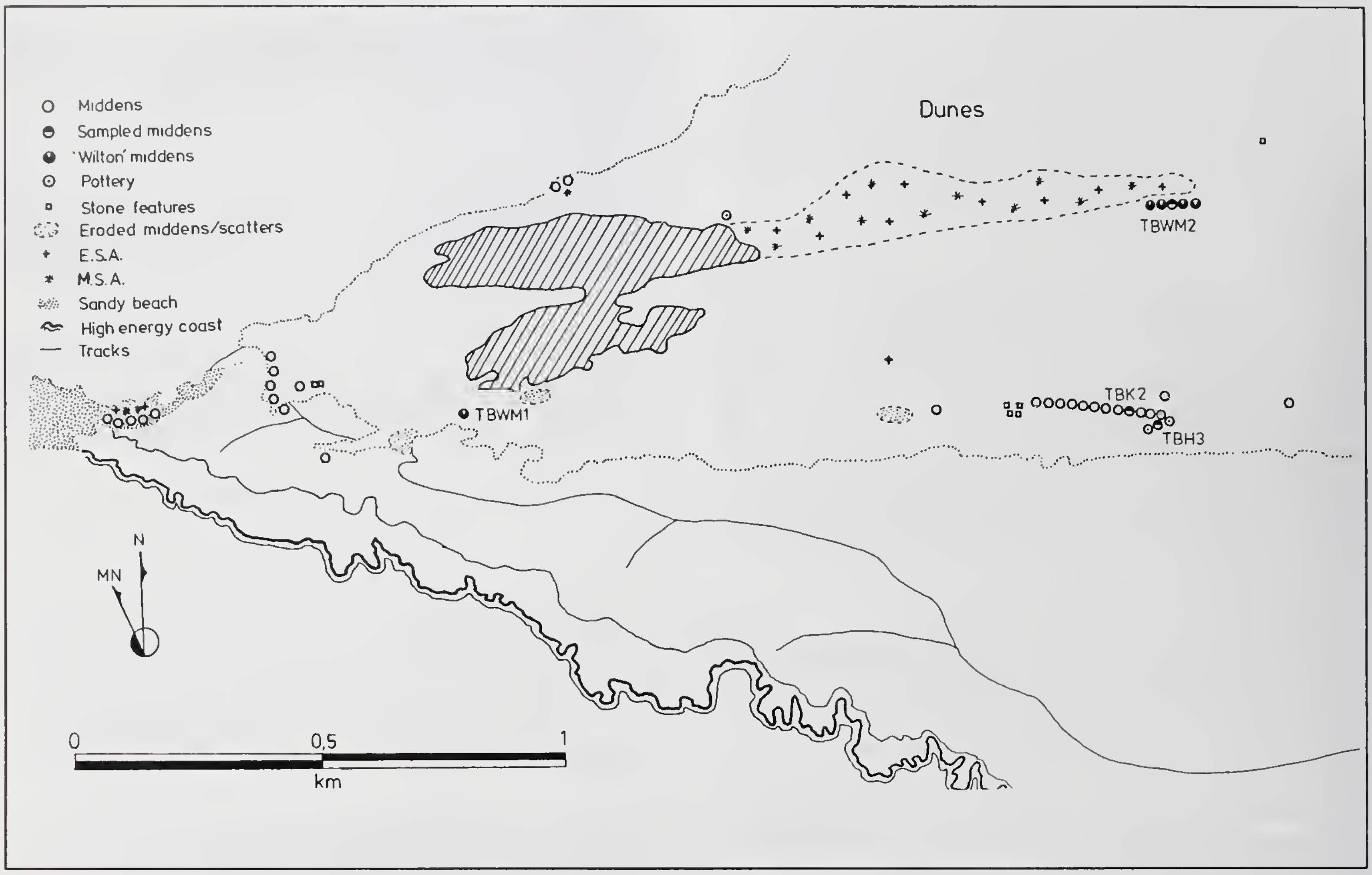

Fig. 13. Map of the archaeological sites and features at Thysbaai and adjacent dunes.

Table 17. Shellfish frequency percentage per species and percentage meat mass contribution from the Thysbaai middens.

	TBW2+				TBK2#				TBH3*			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	27	9,2	210,6	10,6	47	11,4	366,6	25,2	5	1,5		
Donax serra					2	0,5						
Patella argenvillei	77	26,3	539,0	27,2	27	6,6			26	7,7	182,0	10,3
Patalla barbara	3	1,3			3	0,7						
Patella cochlear	110	37,5	440,0	22,3	202	49,1	808,0	55,6	14	4,2		
Patella longicosta	14	4,8			18	4,4						
Patella miniata												
Patella oculus	4	1,4			12	2,9			24	7,1		
Patella tabularis	19	6,5	281,2	14,2	9	2,2						
Haliotis midae	1	0,3	260,8	13,2	2	0,5						
Haliotis spadicea					7	1,7						
Oxystele spp.	19	6,5			53	12,9			162	48,4	243,0	13,8
Turbo sarmaticus	15	5,1	246,5	12,5	21	5,1	279,3	19,2	100	29,8	1330,0	75,8
Burnupena spp.	4	1,4			6	1,5			3	0,8		
Dinoplax gigas					2	0,5			2	0.6		
TOTAL	1022	100,0	1978,1	100,0	411	100,0	1453,9	100.0	336	100,0	1755,0	99,9

	TBW2	TBK2	TBH3
Buckets sampled	1	1	1
Buckets analysed	1	1	1
Meat mass/volume	1978,1	1453,9	1755,0
Total collecting mass	7010,5	5234,3	7724,8
% meat mass of total mass/volume	**28,0**	**27,8**	**22,7**

+ Wilton Industry # Kabeljous Industry * Pottery present

Only those shellfish species which contributed relatively high meat mass are considered.

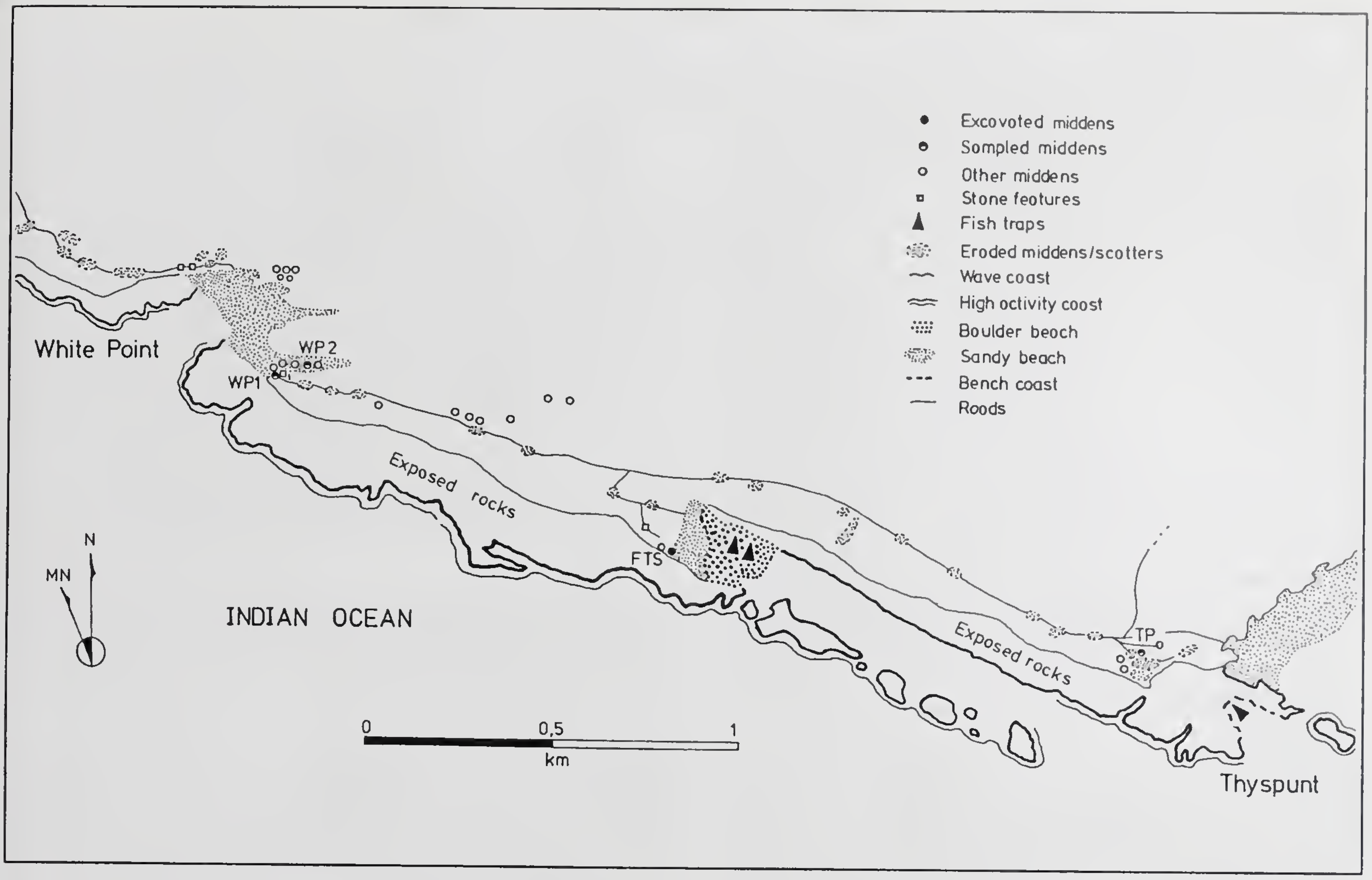

Fig. 14. Map of the archaeological sites and features at Tony's Bay.

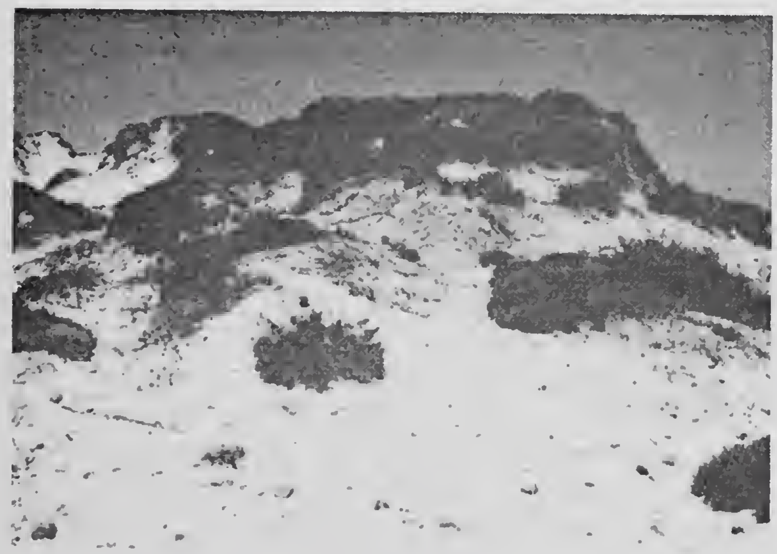

Fig. 15. Shell middens and stone features in the dunes at White Point.

rich in shell middens (Fig. 14). The dune field adjacent to Tony's Bay contained a large number of Middle Stone Age sites with well preserved bone (Binneman 2001, fig.7). Most of the sites were situated on old deflation surfaces, calcretes and fossilised dunes. A complete survey of the visible archaeological features along the coast was conducted.

The middens along the coast were mainly visible in road cuttings, except for a large accumulation at White Point (Fig. 15). A few middens were sampled to establish the shellfish content of the different types of middens. The middens associated with stone features did not contain pottery as did those at De Hoek. Middens were also sampled between White Point and Thyspunt. Two fish traps are present along this part of the coast, a small one at Thyspunt and a large one between Thyspunt and White Point. A small midden (FTS) which contained abundant fish remains and pottery was sampled at the large fish trap.

WP1 & 2

A large concentration of middens associated with stone features were situated at White Point, near a small sandy beach flanked by high activity wave beaches (Fig. 9). Two HCF middens were sampled here, one associated with a stone feature (WP1) and one which displayed an interesting content of shellfish remains (WP2). The shellfish sample from WP1 consisted mainly of *P. longicosta*, 28,2% [37,1%], followed by *P. perna*, 16,5% [25,5%] and *P. cochlear*, 14,6% (Table 18). The ERR was 25,1%.

WP2 yielded interesting information. This is the only open-air HCF midden investigated which was dominated by *Oxystele* spp. (39,3% [16,6%]) (Table 18). *P. longicosta*, 15,8% [13,4%] accounted for the second highest number. Another interesting aspect is that *D. serra*, 9,7% [35,1%] was also represented at the midden, which suggests that the collectors had to travel at least 3 km to either Thysbaai or Slangbaai to collect them. The ERR was 30,3%.

Table 18. Shellfish frequency percentage per species and percentage meat mass contribution from the Tony's Bay middens.

	FTS*				WP1#				WP2#				TP#			
	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %	f	f %	mm/gr	mm %
Perna perna	55	7,6	286,3	18,7	78	16,5	592,8	25,5	52	8,8	384,8	18,4	13	5,6		
Donax serra	1	0,1			2	0,4			57	9,7	732,9	35,1				
Patella argenvillei	7	1,0			24	5,1	326,4	14,0	19	3,2			21	9,1	207,9	2e+18
Patalla barbara	1	0,1			20	4,2			4	0,7			2	0,9		
Patella cochlear					69	14,6			47	8,0			23	9,9		
Patella longicosta	20	2,8			133	28,2	864,5	37,1	93	15,8	279,9	13,4	50	21,6	150,0	
Patella miniata	4	0,6			6	1,3			3	0,5			3	1,3		
Patella oculus	69	9,5	365,7	23,3	28	5,9			19	3,2			32	13,8	156,8	
Patella tabularis					2	0.4			6	1,0			7	3,0		
Haliotis midae													1	0,4	264,7	
Haliotis spadicea	2	0,3	276,0	17,6	4	0,8							1	0,4		
Oxystele spp.	230	69,9	642,6	40,9	42	8,9			231	39,3	346,5	16,6	25	10,8	518,7	
Turbo sarmaticus	63	8,7			41	8,7	545,3	23,4	26	4,4	345,8	16,5	39	16,8		
Burnupena spp.	24	3,3			19	4,0			30	5,1			4	1,7		
Dinoplax gigas	1	0,1			4	0,9			1	0,2			11	4,7		
TOTAL	4674	100,2	1570,6	100.0	472	99,9	2329,0	100,0	588	99,9	2089,9	100,0	232	100,0	1298,1	

	FTS	WP1	WP2	TP
Buckets sampled	4	1	1	1
Buckets analysed	2	1	1	1
Meat mass/volume	785,3	2390,0	2089,9	1298,1
Total collecting mass	3349,8	9511,2	6906,5	4043,1
% meat mass of total mass/volume	**23,4**	**24,5**	**30,3**	**27,5**

* Pottery present
# Kabeljous Industry

Only those shellfish species which contributed relatively high meat mass are considered.

FTS

This midden was situated at a boulder beach which also housed a large fish trap. The midden yielded pottery, a few quartzite flakes (Table 10 & 12) and a large quantity of fish remains. The sample taken from this midden was totally dominated by *Oxystele* spp. (65,9% [17,6%]). Three other species were also important as far as the meat mass was concerned, namely, *T. sarmaticus* (8,7% [40,9%]), *P. oculus* (9,5% [23,3%]) and *P. perna* (7,6% [18,2%]) (Table 18). The ERR was 23,4%.

TP1

This midden was situated at Thyspunt near a bench coast and a small fish trap. A sample was taken to contrast a hunter-gatherer midden near a bench coast with that of FTS. As expected, *Patella* spp. dominated the sample, with *P. longicosta*, 21,6% [11,6%], accounting for the highest frequency, followed by *T. sarmaticus*, 16,8% [40,0%], *P. oculus*, 13,8% [12,1%], *P. cochlear*, 9,9% and *P. argenvillei*, 9,1% [16,0%]. *Oxystele* spp. only comprised 10,8% (Table 18). The ERR was 32,1%.

Discussion

The shellfish remains confirmed the different collecting strategies between HCF and 'ceramic' groups. The HG and HCF middens were dominated by *Patella* spp. and the 'ceramic' middens by *Oxystele* spp. Samples from large Wilton (TBW2) and Kabeljous (TBK2) middens provided ERR's of 28,2% and 27,8% respectively, which are higher than the 'ceramic' midden which has a ERR of 22,7% (TBH3) (Table 16). The enormous middens in this region may indicate that this area was occupied by large groups for extended periods of time. It is interesting that this area was also used by Early and Middle Stone Age people.

Similar to all the other 'ceramic' middens, FTS was also dominated by *Oxystele* spp. and therefore has a low ERR of only 23,4% (Table 18). However, one of the Kabeljous middens at White Point (WP1) (Fig. 9), dominated by *Patella* spp, has only a marginally higher ERR of 25,1%. Similar results were obtained from another Kabeljous midden sampled at Thyspunt (TP) which has a ERR of 32,1%. The reason being, as pointed out earlier, that although *Patella* spp. are relatively large the ERR was lower than mussels, but on the other hand higher than *Oxystele* spp. This is well illustrated by midden WP2 where *D. serra* were collected which increased the ERR to 30,1% (Table 18). The interesting point at this Kabeljous midden is that *Oxystele* spp. account for the highest frequency collected. This is the only Kabeljous/Wilton open-air midden found where *Oxystele* spp. were collected in such a high percentage frequency (39,3%). However, the other middens in the same area contained virtually no *D. serra*. In

general, the Tony's Bay sites displayed similar patterns as observed elsewhere for shellfish collecting between 'ceramic' and HG/HCF groups.

DISCUSSION OF THE OPEN-AIR MIDDENS

The survey of open-air shell middens along the Cape St Francis coast revealed that approximately 80% were located within 300 m of the coast. More than 95% were situated along the rocky coasts. This pattern is similar to that experienced elsewhere (Avery 1976). However, this is the type of pattern expected for this part of the coast, because the sandy beaches do not have any significant *Donax serra* populations as elsewhere along the eastern Cape coast. Large middens were also found up to 5 km from the coast which indicates that people did not depend on shellfish as a staple food and their resources did not dictate where they could stay.

The shellfish remains recovered from the different types of middens seem to follow two distinct patterns and can be explained in different ways. The HG, HCF and pastoralist middens displayed a similar shellfish collecting strategy. In general they collected those species with the highest meat mass available, and/or those which were abundant, providing they had a relatively high meat mass per species. This pattern is also observed among contemporary shellfish collectors (Bigalke 1973; Meehan 1982). These groups also collected extensively from the lower balanoid zone where the larger shellfish species are to be found, although these species do not necessarily provide the highest ERR's. In general this strategy was practised at all the different habitats. Although not clearly evident in all the middens investigated, it would appear that HG, HCF and pastoralists collected shellfish mainly during the new moon and full moon phases.

The distance between campsite and collecting place also played an important role in the species collected. In the cases where the campsites were far from the coast, for example the Goedgeloof sites, small numbers of small species were brought back. Only those with relatively high meat mass were brought back to the campsites in quantity. The collecting strategies at the Goedgeloof sites are of particular interest because it would appear that these groups collected mainly those species which provided them with the highest ERR's, such as *S. capensis, D. serra* and *P. perna*. They also exploited three different habitats.

The 'ceramic' middens, on the other hand (predominantly those without domesticated fauna), reflect a different collecting strategy. Groups that occupied these sites collected mainly abundant small, easy to collect species with a low meat mass per individual from the upper balaniod zone. In general they practised this strategy at all the different habitats. This collecting strategy was less economical than that of the other groups as is illustrated by the ERR's. This strategy may indicate that 'ceramic groups' collected shellfish regularly irrespective of the tide cycle, species or size, which suggests that they in general were more dependant on shellfish than the other groups. It may be argued that the pastoralists/'ceramic groups' had containers in which they could boil large quantities of *Oxystele* spp. However, there is no historical or ethnographic evidence that shellfish were boiled in pots. Pots were used mainly to boil fat (L. Webley, pers. comm.). 'Ceramic' groups also collected in the immediate area of their campsites. HG, HCF and pastoralists seemed to have often travelled between two to three kilometres from their campsites to the nearest sandy beach to collect *D. serra*.

As mentioned earlier, pastoralist sites reflect a collecting strategy similar to that of the HG and HCF. It is clear from the large number of sheep, presence of cattle (and other resources such as milk) and terrestrial faunal remains present at Goedgeloof that they had no 'shortage' of food. In addition to these resources they probably also built and maintained fish traps. Thus although shellfish were only supplementary to the diet, pastoralists still collected species with high meat mass per individual. The pastoralist middens in the Goedgeloof area also display the highest ERR recorded for the research area. The fact that HG, HCF and pastoralists collected shellfish only at specific periods (spring and neap tide low) when the larger species were available, may indicate that these groups were less dependent on shellfish than the 'ceramic' groups. Shellfish were collected to add variety to the diet, but at the same time the variety had to be supplied to probably large numbers of people. In the case of HG and HCF, shellfish were most probably collected during periods of aggregation. Pastoralists, it is presumed, always lived in relatively large groups. 'Ceramic' groups most probably consisted of smaller numbers of people and they collected shellfish more regularly than the other groups, and therefore collected whatever species were available irrespective of size and species.

Alternatively, it can be argued that pastoralist, HG and HGF were been more dependent on shellfish than 'ceramic' groups. In order to be able to stay in large groups for extended periods, for example during periods of aggregation, groups had to rely on large species as supplement to their diet. *P. perna* and *D. serra* were collected because these species provided the most substantial and profitable return of species available for exploitation. Only those species which were 'socially' to their advantage were collected; in other words, those which made it possible for groups to aggregate. The small species collected by the 'ceramic' groups may indicate that shellfish played a minor role in their diet and were only collected to provide variety. Whatever the case may be, ethnographic evidence seems to suggest that shellfish were only supplementary to the diet even when collected regularly (Meehan 1982). Large amounts of shellfish can in any case only be eaten for limited periods (Noli & Avery 1988).

The one to one explanation of shellfish collecting given above is not entirely convincing. Shellfish collecting, along with all other activities, took place within social contexts. Meehan (1982) and Bigalke (1973) reported that women collected shellfish among the Gidjigali and Nguni speaking peoples respectively, but that men performed this task

among the ≠Aonin people (Budack 1977). Among all three groups men were responsible for catching fish. Whether men also collected shellfish among prehistoric pastoralist groups is not known. It is possible that the ≠Aonin are an isolated case or that the role of shellfish collecting changed during historic times. No direct evidence is available for HG/HCF, but it is assumed that women also collected shellfish.

It can be speculated that the difference in the collecting strategies between pastoralists and 'ceramic' groups may reflect changes in the relations of power. The view taken here is that herding formed the ideological base through which relations of power were generated in and between pastoralist groups. When groups lost their stock, men, women and the group as a whole lost much of their power base. In other words, men lost a substantial amount of status as far as their role as food producers in the group was concerned. Although it is not possible to establish the role of domesticated animals in social relations and subsistence, it can be assumed that pastoralists were most probably dependent on milk and other related products at certain times of the year (Webley 1984). In order for men to remain important food providers they took over the role of collecting shellfish. By adding shellfish collecting to their existing activities of hunting and fishing, they regained some status and power as food providers. This meant that shellfish were collected more often than was the case previously. Alternatively, it can be argued that women also lost part of their power base when the group lost their stock, for example, milking and other related duties that accompanied it. In order to remain important as food providers they collected shellfish more regularly.

As I have explained earlier, one of the most interesting aspects of the open-air shell midden investigation is the fact that there existed two distinct lithic industries side by side along the coast, namely, a microlithic silcrete industry similar to that found in caves and shelters of the adjacent mountains and a quartzite cobble industry which I named the Kabeljous Industry. The industry is named after a shelter with the same name excavated by Dr John Hewit during 1925 (Hewit 1925). These two industries co-existed from ca 4700 BP (at Klasies River Cave 1) to 1720 BP along the Cape St Francis coast. The microlithic assemblages from the shell middens seem to lack backed tools such as segments, but segments were present in the cave sites. The Kabeljous Industry contains all the formal elements of the microlithic industry, only the elements are large and manufactured from a different raw material. Silcrete is absent from the coastal foreland but abundant resources are present in the adjacent mountains (Binneman 1985). In general silcrete is not present on Kabeljous middens, which indicate that these groups did not move beyond the coastal foreland, did not collect silcrete from middens and did not trade for the raw material with groups who brought it to the coast. Middens containing Kabeljous stone tools are distributed throughout the research area, but middens containing microlithic stone tools are concentrated only in the SFB2 and Thysbaai areas. It would appear that silcrete as a raw material is restricted to the western side of the Kromme River.

The Kabeljous Industry do not represent an 'adaptation' to a coastal environment, because the shell fish and the faunal remains are similar to those sites reflecting Wilton Industries. Therefore it would appear that there is no functional reason for the difference in the industries. One suggestion may be that the different lithic toolkits were powerful expressions of symbolic group identity and maintenance of social boundaries (Giddens 1979; Shanks & Tilley 1987; Henderson & Binneman 1997). This aspect and others mentioned above will be discussed in more detail once the research results from the caves and shelters are published.

ACKNOWLEDGEMENTS

I would like to thank the Albany Museum for the support, assistance and infrastructure provided during the study. I am grateful to the many people, too many to mention, who assisted with the project. Those who sorted and processed the samples and assisted with the analysis of the material. I also would like to extend a special thanks to James Brink for the analysis of the mammal remains, John Vogel and Stefan Woodbourne for the radiocarbon dates

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Southern African Field Archaeology **13 & 14**: 78-80. 2004/2005.

RESEARCH NOTES

New evidence for the origin of the Zerrissene Mountain (Namibia) excavations and diggings.

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In 1978, the Carrs and I published a report on the archaeology of the Zerrissene Mountain area. This consisted mainly of hut remains and other types of stone structures but also included a limited range of material objects and fauna, a painted shelter, a dog burial and a number of puzzling pits which we referred to as excavations and diggings (Carr *et al.* 1978).

These so-called excavations and diggings had an apparent spatial association with the settlements and occurred on low ridges and on the slopes of low hills. In general, they were approximately 1-2 m across and 0.5 m deep although they ranged in size considerably. Hence our reference to diggings which were defined as minor surface disturbances and excavations which were major features from which several tons of rock had been removed. The largest pit had some 3-4 m^3 of rock excavated which in terms of weight means that nearly 10 tons of stone was removed.

In our original report, we were quite baffled by these pits and although we had suggested that they might have been old prospecting pits we discounted this based on geochemical assays for copper and gold which produced very low values.

Kinahan (1991) subsequently interpreted these pits as sites where harvester ant seed caches had been dug up. The robbing of harvester ant nests for their seed had been well documented for this area (Du Pisani 1978; Jacobson 1981a, 1984; Steyn & Du Pisani 1985) but although not referenced by Kinahan this explanation for the origin of the pits is unrealistic. Harvester ants nest in sandier substrates than found on rocky ridges or slopes. It is fanciful to believe that 10 tons of rock were removed for perhaps a kilogram or two of seed: the labour needed would surely make it uneconomical. These settlements were in the area not because seed caches were available but because there was water and grazing available for small flocks of sheep or goats.

Pastures in this arid environment are most definitely not annual but highly dependent on patchy rainfall (Sharon 1972, 1981; Lancaster *et al.* 1984) which might only occur once or twice over a decade with the necessary minimum precipitation, 21 mm, to ensure that a standing crop is produced (Seely 1978a, & b). This patchiness also makes it difficult to predict whether it will rain and where it will rain (Gamble 1980; Jacobson 1981b). However, as it can take anything from two weeks or more for growth and seed to set, depending upon the grass species and the amount of rain, it does provide time for suitable grazing areas to be located. Occasionally, very heavy downpours occur resulting in exceptional grazing and water sources which can last months hence the isolated areas of dense settlement such as the Zerrissene. For example, Gobabeb which has an average of 27.2 mm annual precipitation (Lancaster *et al* 1984), received 98 mm between January and March of 1978 alone (Seely 1978a).

In the mid 1980's, during a visit to the area, several nests were found including a large one near a spring (Fig. 1) but none on the ridges or hill slopes. These observations also contradict Kinahan's assertion that there are no longer any ant nests or seed caches in the area.

Recently, however, I came across a quote referenced to an unpublished report by the Solar Development Company which had carried out geological prospecting for minerals in approximately 1930-32 (Schroder 1932) or even earlier: "Gold is associated with pyrite and galena in small quartz lenses on the south-eastern side of the isolated mountain south of Brakputz on the Ugab River. This is the unnamed mountain 20 miles west of the Brandberg and five miles south of the Ugab." (Willemse *et al* 1944:165). This is

Fig. Collecting grass seeds from a cache in the Zerrisene Mountains, winter 1985.

clearly and without any doubt the Zerrissene Mountain, a fact corroborated by Swart (1992) who investigated the geology of the area and who mentions the same quote.

It is therefore more likely that the pitting relates to this period and was part of the company's sampling program. The later trench documented by us cutting across an older pit therefore dates to the later prospecting program carried out by the Brandberg West Tin Mine. The apparent association of the pits with the settlements could either be fortuitous or, more likely, that the prospectors associated the stone remains with precolonial indigenous mining.

Many of southern Africa's first colonial mining ventures were founded on the sites of indigenous mine workings (*eg*, Summers 1969) and up until the 1930's memories of this would have been still fresh amongst the older generation of miners and prospectors. This is particularly so for gold mines and Solar was looking for gold amongst other minerals. Optimistic reports that gold was present, although in this case our geochemical results showed it to be negligible, were often made as reefs had value not just for any actual gold they might contain but as "baits for investment capital" (Summers 1969:5), in other words, as an enticement to raise money for further exploration work. The presence of substantial numbers of hut remains in an otherwise remote and apparently inhospitable area could have suggested to the Solar geologists that there was potential in the area hence the exploratory pitting.

There are numerous other highly localised similar sites both in the vicinity of the Ugab River/Zerrissene area and in the more westerly areas of Damaraland as a whole (Jacobson 1979, 1997; Speich 1999, 2002, 2005) in very similar environments none of which have the same pitting although harvester ant nests must have occurred in the past as grass seeds are still collected today (Sullivan 2005). The pits found in the Zerrissene Mountains do not to therefore relate to the original settlement of the area but subsequent prospecting activities. Settlement in an arid area was not related to the presence of grass seed caches, although these would have been utilised as any other subsistence resource, but was dependent upon rainfall providing water and pasture for either game or domestic stock whilst the intensity and duration of the precipitation determined the duration and demographic intensity of the settlement.

ACKNOWLEDGEMENTS

I would like to thank Dr Hamish Robertson, Iziko Museums, for assisting me with information about harvester ants, Mrs T. Anderson, McGregor Museum, about grasses, Mr van Tonder, Namibian Geological Survey and Mr G.

Levine of Johannesburg for references to the Solar Development Company.

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Southern African Field Archaeology **13 & 14**. 2004/ 2005.

BOOK REVIEWS

THE ARCHAEOLOGY OF SOUTHERN AFRICA

By Peter Mitchell. 2002. Cambridge: Cambridge University Press. (African Edition). Cambridge Africa Collection limited for sale in countries in sub-Saharan Africa. pp. 515.

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I, and probably many other young academics, agree to review books, because in return we are allowed to keep the review copies of these books. Our 'mercenary' attitude to book reviews is the result of the cost of books in southern Africa. Imported academic books are expensive, due to unfavourable exchange rates, and local taxation of imported books. The cost of books not only affects individuals, many southern African University libraries can simply not afford to purchase new books and pay their journal subscription fees. This removes southern African scholars, from the academic information network, and has dire implications for the quality of knowledge our graduates acquire. In the light of this, the publication of this volume as part of the (cheaper) paperback Cambridge Africa Collection, which is limited for sale in southern Africa, is heartening.

The Archaeology of Southern Africa is substantial, and Mitchell was courageous to undertake a synthesis of southern African archaeology, as this is a perilous endeavour. Irrespective of the balance of the text as a whole, there is bound to be focus on, and criticisms of the inclusion or exclusion of data, and interpretation of nuances. I feel myself only qualified to critique the farmer archaeology section, which forms a small portion of the volume.

Consequently, I decided to (mostly) refrain from discussing inclusions of particular data sets, and to rather examine how data is presented.

I start with the obvious. This is a clearly written, and laid out, synthesis of southern African archaeology. It engages with the main data sets and debates. It, obviously, is impossible for Mitchell to have knowledge of, never mind write about, every topic, debate and discovery in southern Africa. Consequently, there are omissions. An example from my research area, the Shashe Limpopo Confluence Area, is Calabrese's discovery of the continuity of Zhizo settlements in the Limpopo valley, after the Leopard's Kopje people occupied the area. These K2 period Zhizo settlements are marked by a new ceramic tradition, Leokwe Zhizo, which combines K2 design elements with Zhizo decoration techniques (Calabrese 2000a & b). I am sure that there are other oversights in other research fields. This is to be expected, and does not detract from the value of the contribution.

The book follows the traditional divisions of Stone Age (Chapters 3 to 7), San Rock Art (Chapter 8), Pastoralist (Chapter 9), Farmer (Chapters 10 to 12) and Historical Archaeology (Chapters 13 and 14). These topics are organized in chronology-based succession. On one level this organization succeeds, and results in an elegant flow of narrative. On another, these categories perpetuate an illusion of isolated and bounded communities who lived in different 'Ages'. This arrangement complicated the placement of the sections on interaction between farmers and hunter-gatherers. By sub-summing these into the farmer chapters, the arrangement directly contradicts the text, which argues "it is by no means clear that contact per se should, as the revisionists suggest, produce relations of dominance and subordination" (Mitchell 2002:224). The current layout creates the impression that contact took place in the 'farmer' period, thereby implying that farmers set the interaction agenda.

Due to historical processes, underdevelopment, as well as long-term conflict in some countries, there are variations in the intensity with which archaeology in different parts of southern Africa has been studied. This is reflected in the data synthesized here. I did, however, find the volume to be rather South Africa centric. I was disappointed not to see more discussion on research from other parts of southern Africa, as the title implies. The bias in inclusion might, partly stem from Mitchell's predisposition towards Anglophone publications. I counted less than ten non-Anglophone titles in the bibliography.

In spite of dealing with the 'archaeological data' comprehensively, this volume seems to be theoretically uncritical and un-rooted. This approach allows Mitchell to

separate and compartmentalize the political and the archaeological, which ignores that southern African archaeology and politics have been intertwined. Most southern African archaeologists no longer attempt to pretend that their work is not influenced by the socio-political situation. Mitchell's non-engagement might be the result of his location in Britain. He is on the outside looking in. This neutrality is in sharp contrast with the most recent South African undergraduate archaeology textbook: Martin Hall's Archaeology Africa, which is located on the inside and deeply influenced by the theoretical and political. The pairing of these two texts, Mitchell's concrete data synthesis and Hall's more political and theoretical content, forms the perfect undergraduate teaching duo.

It is in this field of facilitating the teaching and learning of archaeology, that this book is most valuable. The simple language and arrangement will help newcomers to the discipline. The comprehensive inclusion of data and references, means that more advanced students can employ this volume as an entry into debates, or research questions they are exploring. At R190.00, for a paperback edition, some of these students might even be able to buy their own copies.

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THE FIGURED LANDSCAPE OF ROCK-ART: LOOKING AT PICTURES IN PLACE

By Christopher Chippindale and George Nash (eds). Cambridge University Press, Cambridge, UK, 2004. ISBN 0 521 52424 5.

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This book serves as a companion to The Archaeology of Rock Art (Cambridge University Press, 1998). The earlier publication focussed on the archaeological aspect of rock art, approaching rock art as a material record of the past. Drawing together research from numerous scholars, this volume emphasizes the importance of the landscape where rock art occurs - both the geographical location and the placement of images in a site, as well as its spiritual dimensions.

In the introductory essay, Christopher Chippindale and George Nash suggest that the immovability of rock art pictures as permanent markers in the landscape is a central strength and also a central concern, both on large scale and also in and around a rock art panel. They note the difficulties presented by uncertain chronology, but argue - with examples from across the world - that these are compensated for by the certainty of rock art being fixed in place, giving a firm starting point for research. Recent trends in landscape archaeology that are pertinent to rock art studies are examined, followed by a discussion of informed and informal methods for studying rock art, as well as definitions and research practicalities. Finally, the authors present the rational and structure of the book, noting that although the majority of the contributions favour informed research methods, collective patterns emerging from the informed methods can be used to build formal methods that can be applied over a broad range of study.

The book is divided into four parts, the first dealing with the principles of landscape and rock art in practice:

Paul Taçon and Sven Ouzman investigate areas of commonality between rock art in topographically comparable areas of southern Africa and northern Australia. Rock art imagery demonstrates how hunter-gatherers experienced and understood the world and rock art sites - and the rock itself, function as places where worlds of extra-ordinary and 'ordinary' existence come together.

When attempting to interpret ancient cultural landscapes, the need for including a spiritual dimension found in oral traditions is addressed by Daniel Arsenault. Demonstrating that some 'objective' models of analysis and interpretation fail in capturing the world view of Native Peoples of Canada. He includes theoretical, methodological and practical aims to be included when studying sacred landscapes.

William Hyder discusses the use of locational analysis in rock art studies. This formal methodology for analysing the location of rock art in the landscape relies strongly on awareness by researchers of the scale of the system that will be studied, and a correlation between the questions asked and the data collected.

Reporting and studying the immensely varied physical scales encountered in rock art research can be a substantial challenge. Christopher Chippindale proposes a flexible framework aimed at greater unity. The author demonstrates that employing four physical scales of rock art, each linked to a particular aspect of rock art study, can be useful when dealing with the varied physical scales encountered in rock art research.

Relating examples from western North America and European Upper Palaeolithic rock art, James Keyser and George Poetschat investigate the rock surface not just as a neutral canvas, but from the viewpoint that it was selected for natural features that were incorporated in the art. They demonstrate the interplay between the rock surface of an individual rock art panel and the images thereon, just as rock art exists at distinctive points on the varied surface of the earth.

Using Gestaltung - described here as the physical acts whereby a landscape is changed as it is endowed with meaning, Tilman Lenssen-Erz develops a systematics of landscape focusing on the Brandberg, the foremost rock-art area in Namibia. Elements of the landscape setting for rock art are used in this way to demonstrate the human choices and decisions leading to motifs occurring at particular places, panels and locations.

Part Two explores opportunities and applications associated with informed methods of studying rock art:
Bruno David discusses the emergence of late Holocene symbolism in north-east Australia, making use of excavation data, ethnography and direct dating of the rock art. Images of particular animals used to mark the landscape emerges in the late Holocene and are linked to how the landscape was experienced by hunter-gatherers, and how this experience is reflected in both the rock art and its location in the landscape. Landscape components were employed in the rock art, expressed by patterns of continuity and change in the representation of animals in the rock art over time.

With extensive use of ethnography, Josephine Flood explores the way in which rock art - in the extra dimension of meaning created by the placing of images, helps to explain and map the land of Aboriginal Australia. The ideas of 'Dreaming' and 'Dreaming Tracks' in Aboriginal religion, the landscape, and rock art are demonstrated to influence interwoven relationships between sites and between figures in a site. In this living tradition, the significance of rock art and the landscape continues from the Dreamtime to the present and future.

Lawrence Loendorf investigates the Dinwoody rock engravings in the high mountains of Wyoming. He argues that the petroglyphs follow a pattern of distribution in the landscape according to their elevation and that the choice of images is influenced by the Shoshone world-view according to what power is traditionally seen to inhabit a particular landscape.

Why does one site differ from the landscape pattern of others in an area? David Whitley, Johannes Loubser and Don Hann explore the central significance of symbolic meaning against the backdrop of the Modoc Plateau in western North America. Landscape, along with being a physical place, has conceptual and symbolic elements ascribed to it. Ethnography linking rock art to shamanism reveals variable conceptualisations that influence the complexity and forms of sacred landscapes.

Benjamin Smith and Geoffrey Blundell demonstrate the considerable variation between cultures in their experience and perception of landscape, and that researchers may unwittingly fall prey to historically situated western perceptions concerning landscape. Applying landscape methodology to three rock art traditions from northern South Africa, the authors demonstrate that, without ethnography, a landscape rock art study of this area would not be very useful. They caution against treating landscape as a straightforward given, and bestowing it a position above other approaches.

Part Three explores opportunities and applications associated with formal methods of studying rock art:

Knut Helskog examines rock carvings at Alta in far northern Norway - interpreting panels as large-scale compositions serving as physical models of the landscape that also incorporate time. Knowledge of the Sami is incorporated as the author investigates the different elements of the stories these rock carvings represent. Along with physical features of the landscape represented in the panels there are elements of actors, place and time reflecting cyclical transformations of the landscape.

The relationship between spiritual places and their setting in the Canadian Shield area is the setting for Daniel Arsenault's second contribution. Drawing from Algonkian ethnography and ethnohistorical knowledge - combined with rock art and archaeological evidence, a distinct pattern in the placement, execution and depiction (or absence thereof) of the rock art, emerges. This approach proves to be significantly more useful than simplistic assumptions of relationships between primitive people and ecosystem.

Andrea Arcà investigates topographic elements in Alpine rock art from the French Maritime Alps. These compelling engravings, with features of fields, settlements and agricultural landscapes as they are seen from above, are placed in a regional chronology of agricultural patterns that diffused from the southern to the central Alps. They are suggested to represent a conceptualised topography of a landscape of human territory, expressing social values of ownership and marking of the landscape.

Part Four is entitled 'Pictures of pictures' and contains the final contribution. George Nash, Lindsey Nash and Christopher Chippindale present a photographic essay. The reader is taken to rock art sites in the Campo Lameiro valley in north-western Spain - a journey through different spatial perspectives, from expansive wide-angle views right

up to individual images, experienced at different times of day. A striking visual phenomenology is produced, made all the more commendable considering it was created in a small basement in Cambridge.

The Figured Landscape of Rock-Art: Looking at Pictures in Place, provides an extensive investigation into looking at rock images on an unmoveable surface at a fixed place. This may seem obvious and simplistic at first glance, but the contributions in this publication have effectively demonstrated the advantages and value of incorporating landscape in rock art research. The book is recommended reading to all who are interested in rock art studies.

RESEARCHING AFRICA'S PAST. NEW CONTRIBUTIONS FROM BRITISH ARCHAEOLOGISTS

By Mitchell, P., Haouar, A. & Hobart, J. 2003.. Oxford University School of Archaeology Monograph 57. 152 pp, illustrated.

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This book, with its rather nationalistic title, comprises 17 papers given at a conference organised by Peter Mitchell at St Hughes College in Oxford in 2002. It also includes an obituary for Desmond and Betty Clark, written by Ray Inskeep, who himself has passed away in the interim. The work documents the resurgence of interests of a new generation of Africanist scholars, after a lacunae of about two decades when Africa seemed to be of less importance to British researchers.

The papers are an eclectic mix, and the archaeology is from all over the continent. The only unifying theme is the fact that the authors are British researchers working in Africa. With the single exception of a paper on the hominid landscapes of Makapansgat, all the papers deal with the either the Later Stone Age (of South Africa and Ghana), or more recent periods. Ten of the papers focus on the proto-historic or later (*e.g.* Aksum, Timbuktu, Engaruku, Buganda), showing perhaps a predilection of the younger generation for the historic periods. One paper is on fishing in rock art, another on the ethnography of ostrich eggshell bead manufacture, and another on cultural resource management in Ethiopia. The concluding chapter by Paul Lane reviews the papers offered, then goes on to deal with Thabo Mbeki's *African Renaissance,* and the pros and cons of making use of the Africa's past, with the potential for 'invented traditions'. Lane is keen for there to be 'several pasts' that allow for national discourses, while permitting change to exist alongside stability, continuity and indigenous achievements.

The papers have varying strengths and weaknesses, but all show a commendable commitment to intensive research in Africa, and the researchers have obviously found funding sources to feed their interests. Lane's reasoned summary and comments not withstanding, this book is nonetheless written by outsiders about Africa. While the authors might be aware that they are giving 'voice to genuine African lives and accomplishments' only one African scholar (Muringazina from Zimbabwe) contributed to the volume, although it is possible that other African students were among the more than 100 attendees at the conference.

The book is hard cover, and beautifully finished. One could only wish that the BAR volumes emanating from Oxford were of such fine quality.

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Southern African Field Archaeology

southern african Field archaeology 2002/3 Vol. 11 & 12

CONTENTS

OPINIONS 1

ARTICLES

The Bakopa of Thabantšho: historical background, site description and initial excavations as part of the Maleoskop archaeological project.
W.S. Boshoff, D.J. Krüger & M.M. Leonard 3

Boleu: faunal analysis from a 19th century site in the Groblersdal area, Mpumalanga, South Africa.
Shaw Badenhorst & Ina Plug 13

Later Stone Age burials from the Western Cape Province, South Africa part 1: Voëlvlei
A.G. Morris, N. Dlamini, J. Joseph, A. Parker, C. Powrie, I. Ribot & D. Stynder 19

A Late Iron Age/contact period burial at Stand 1610, Hillside Street Silver Lakes, Tshwane.
Anton Pelser, Frank Teichert & Maryna Steyn 27

"De-!Kunging" the Later Stone Age of the central interior of South Africa.
A.J.B. Humphreys 36

Archaeological mitigation for Project Lion.
T.N. Huffman 42

Archaeological research along the south-eastern Cape Coast part I: open-air shell middens.
Johan Binneman 49

RESEARCH NOTES

New evidence for the origin of the Zerrissene Mountain (Namibia) excavations and diggings.
L. Jacobson 78

BOOK REVIEWS

The archaeology of southern Africa. Peter Mitchell.
M.W. Schoeman 81

The figured landscape of rock-art: looking at pictures in place. Christopher Chippindale.
Andrew Salomon 82

Researching Africa's past. New contributions from British archaeologists.
P. Mitchell A. Haouar & J. Hobart
Andrew B. Smith 84

INSTRUCTIONS TO AUTHORS .... **inner back page**